



Precise Positioning applications and developments in meeting market needs in MALAYSIA

Noordin Ahmad

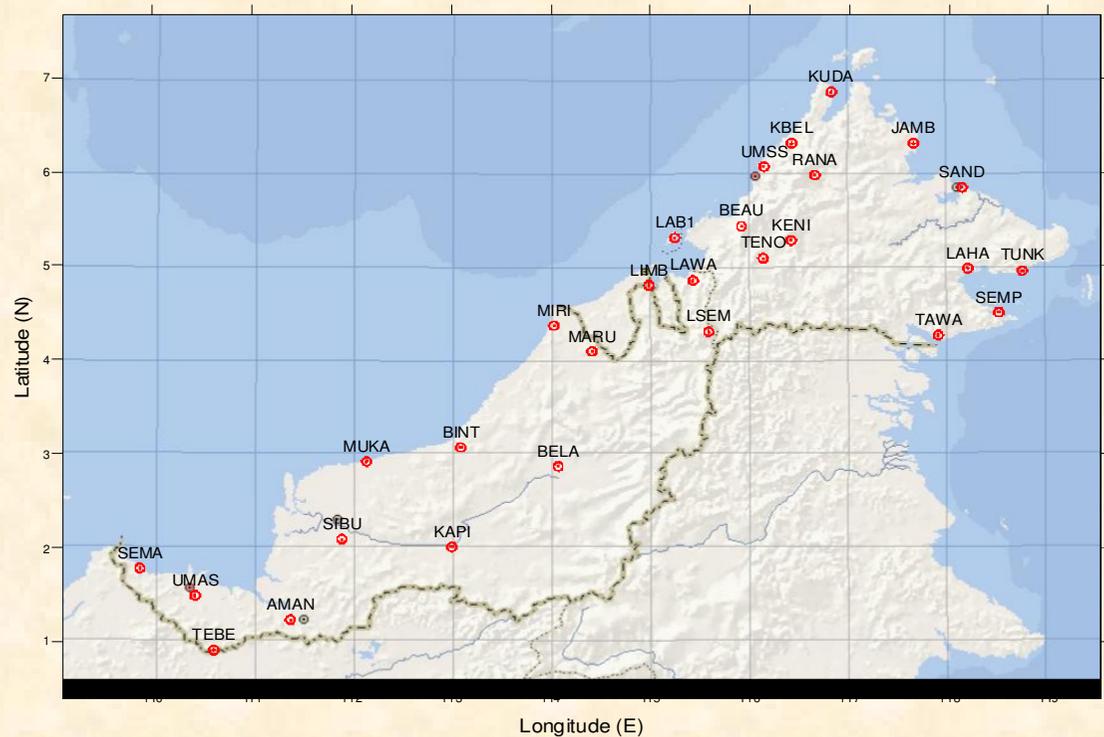
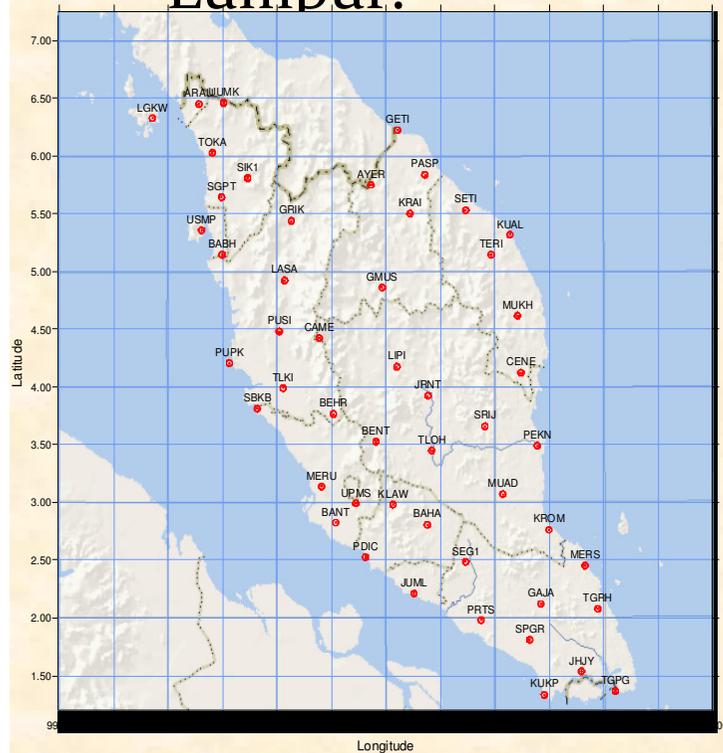
**National Space Agency of Malaysia
(ANGKASA)**

Infrastructure 1: MyRTKnet



- i. Owned and Operated by Department of Survey and Mapping Malaysia (JUPEM).
- ii. Objectives:
 - * For GNSS Real-time Positioning.
 - * Reference Frame and Coordinates System.
 - * Geodynamic Studies.
- iii. Use of a network of reference stations to model the systematic errors and provides the possibility of an error reduction.

- i. Network of **50** dual frequency GNSS reference stations in Peninsular Malaysia
- ii. Network of **28** dual frequency GNSS reference stations in East Malaysia
- iii. Control Centre at JUPEM Headquarter, Kuala Lumpur.



MyRTKnet Reference Station Monuments



VRS Correction

- a) Within the limits of our MyRTKnet Dense Network, MyRTKnet provides VRS GPS corrections with an accuracy of 1 to 3 cm horizontally and 3 to 6 cm vertically.
- b) Distance dependent errors are considerably minimized with utilization of the MyRTKnet network, thereby achieving increased accuracy and reliability.
- c) RTK Surveying works at its optimum with a base station network to achieve the pinnacle of RTK Technology production potential.

Accuracy

- VRS and Single Base RTK
 - ± 3 cm
- DGPSnet
 - $\pm 20 - 50$ cm
- Post-process Virtual Rinex Data
 - $< \pm 3$ cm

Marine Navigation - SISPELSAT



IALA Recommendation on the Performance and Monitoring of DGNSS Services in the Frequency Band 283 - 325 kHz

DGNSS system with coverage of Peninsular Malaysia :

Control Station: Port Klang

2 Remote Monitoring Station

4 Broadcasting (Reference) Station:



Benefits Of SISPELSAT

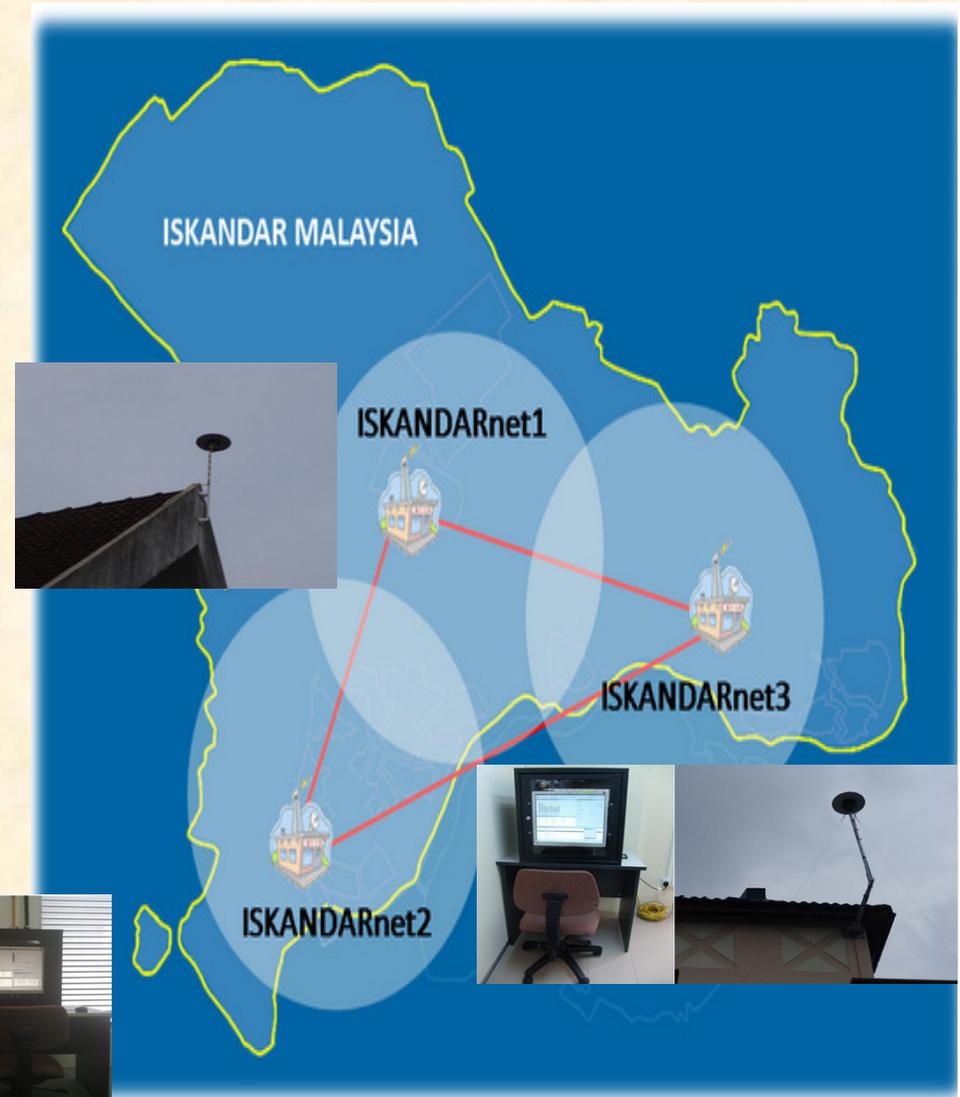
By improving accuracy and safety of maritime navigation, the DGNSS system is able to accomplish the following:

- ❑ Increased nominal accuracy from 10-15m (GPS only) to 1-3m with DGPS.
- ❑ Faster transit times for commercial shipping
- ❑ Increased safety through reduced risk of collisions
- ❑ Cleaner seas through reduced risk of maritime accidents
- ❑ Better position for marine studies – hydrographic survey
- ❑ Aids to navigation system – positioning of Buoy
- ❑ Oceanographic studies/research
- ❑ Oil exploration
- ❑ Fisheries

ISKANDARnet



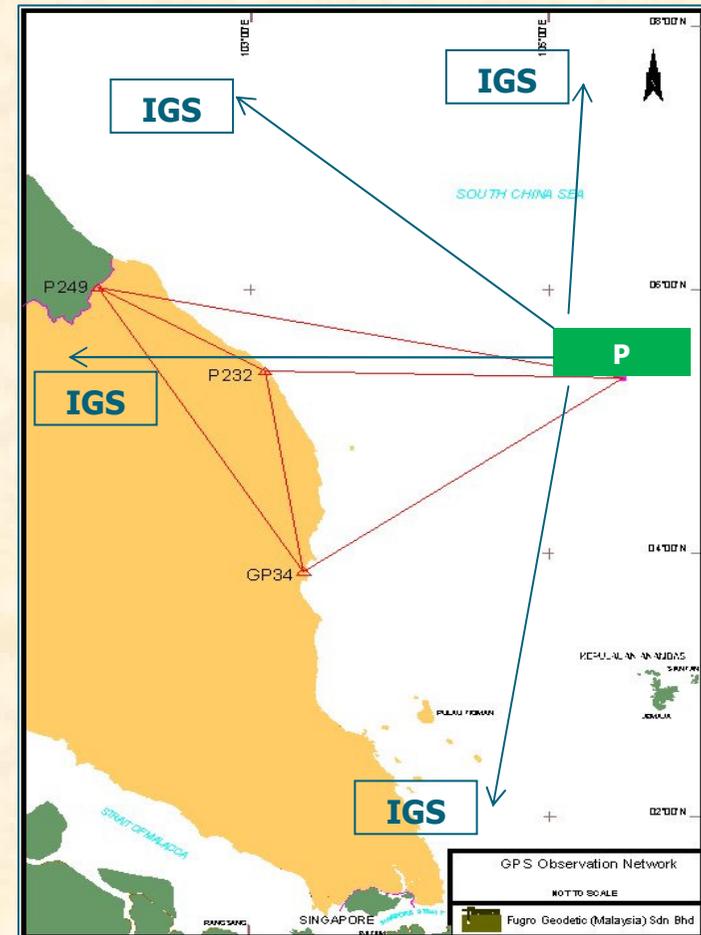
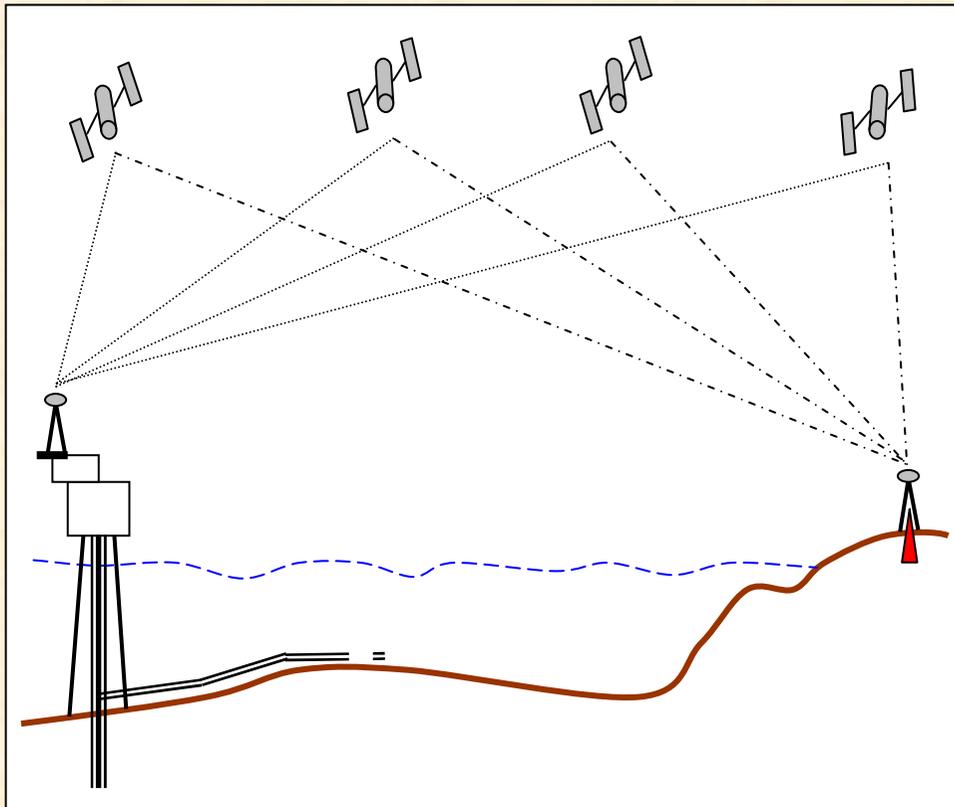
- A GPS positioning support system that provides a precise and accurate GPS satellite data correction services.
- Coverage of Iskandar Development Region (IDR)
- Three CORS stations.



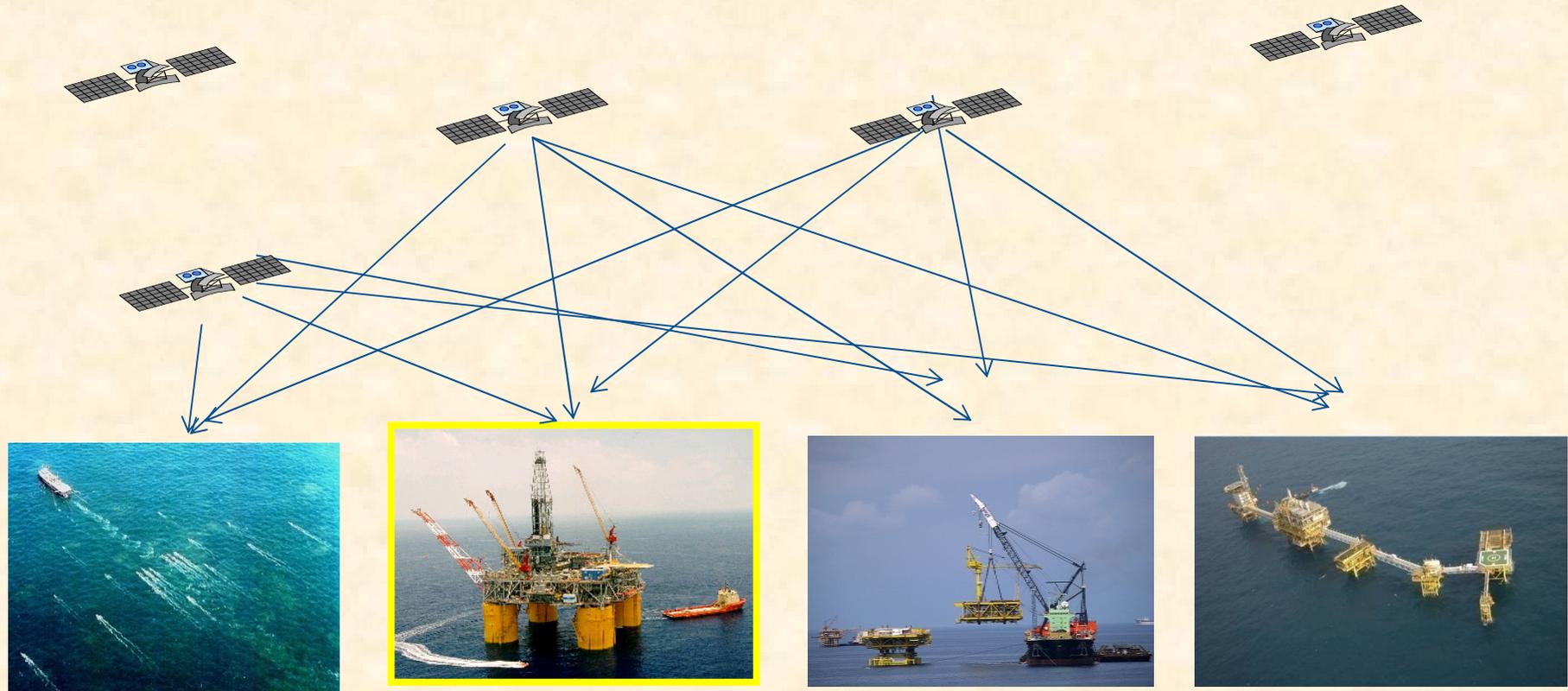
Platform Subsidence



- detect subsidence due to reservoir compaction
- effect on structural integrity



• O&G Industry (Petronas)



EXPLORATION

- Vessel positioning
- Sensor positioning
- Fish traps survey

APPRAISAL

- Rig positioning
- Vessel positioning

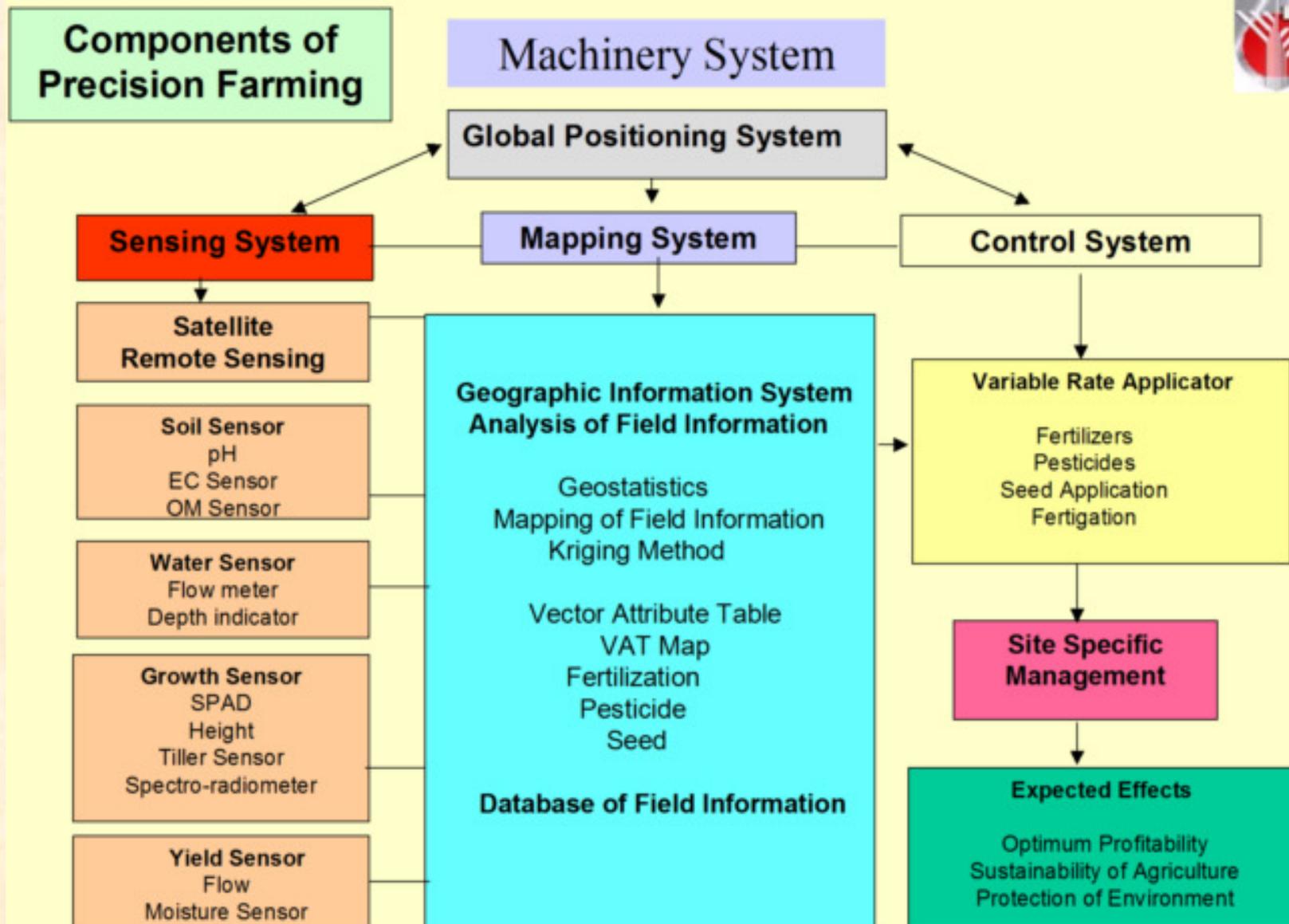
DEVELOPMENT

- Vessel positioning
- Barge positioning
- Platform positioning
- Pipeline positioning

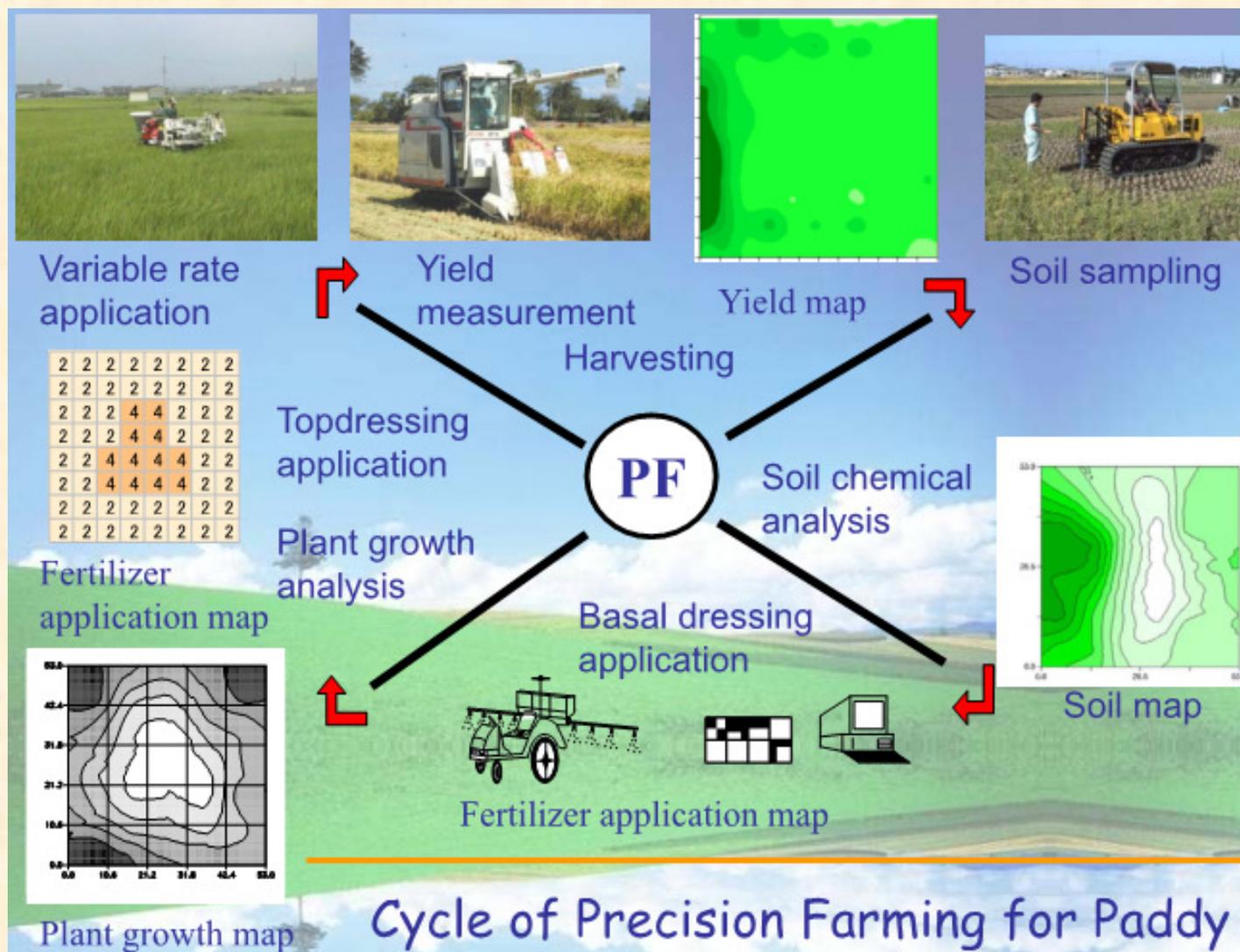
PRODUCTION

- Barge positioning
- Vessel tracking
- *Subsidence survey*

Initiatives for Precision Farming



Various integration of GNSS into Precision Farming



Cycle of Precision Farming for Paddy

Nature Conservation

Elephant Satellite Tracking Movement Study

Dispersal of Turtle Hatchlings Pattern

Elephant Satellite Tracking Movement Study

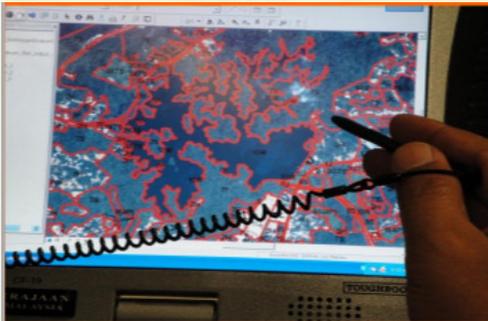
WWF-Malaysia / Sabah Wildlife Department



Other Initiatives for Precision Farming

Department of Agricultural

- Soil Investigation, Fertility, Conservation
- Land-use Investigation
- Crop pest diagnostic services
- Quality control
- Engineering
- Horticulture



GNSS Local Applications



Thieves sent to Japan for 'courses'

Car theft syndicates are investing in their members by sending them overseas.

A source revealed that some syndicate members, especially those on the ground, are sent to Japan for a three-month course to learn about alarm systems and how to disable them.

Japan is the country of choice because it is the home to some of the biggest car makers such as Toyota and Honda.

While some master the art of disabling car alarm systems, others learn how to make duplicate keys.

Each syndicate member looks at a skill, including opening steering locks. They also specialise in a particular make of car.

For example, one will be an expert on Toyota models while another focuses on Honda.

It is understood that each time a new Japanese car is introduced, the syndicate sends its members to

Japan to learn everything about the model.

This is because orders from foreign buyers will come in for the new model and the syndicate wants to be prepared to meet the demand.

Car theft syndicates also offer their customers, including car brokers, side packages like altering the chassis number, duplicating car keys, and forging road tax discs and registration plates.

The packages cost between RM2,000 and RM450,000, depending on the vehicle.

Stolen cars sold locally are mostly stripped for their parts.

Certain types of vehicles, including the Mercedes-Benz and BMW, have state-of-the-art systems which make them difficult to be broken into and disabled.

In such cases, the thieves will wait for the owners to get into their cars or follow them home before hijacking the vehicles.



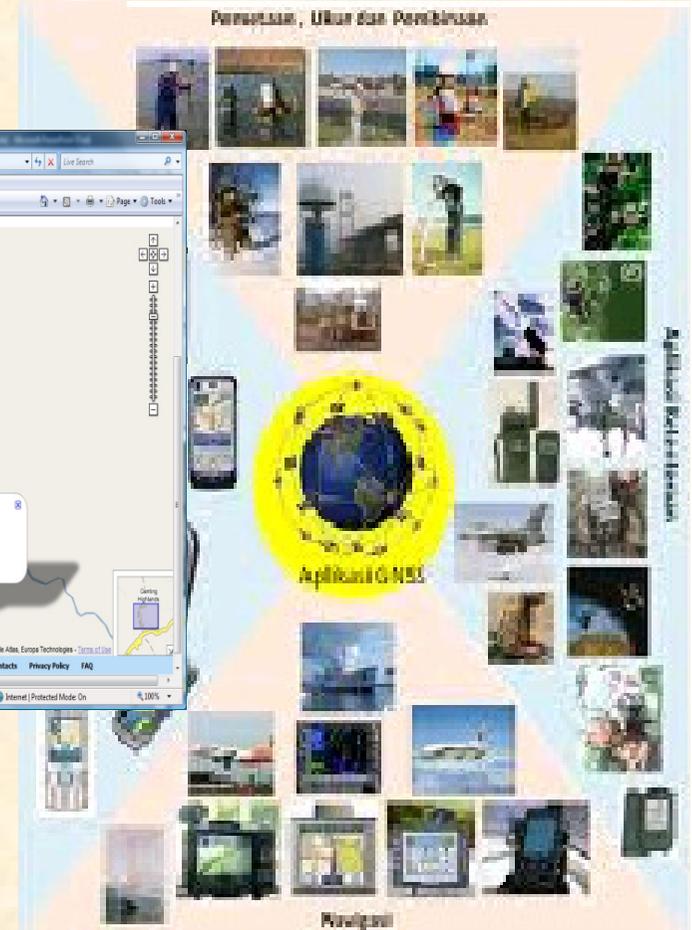
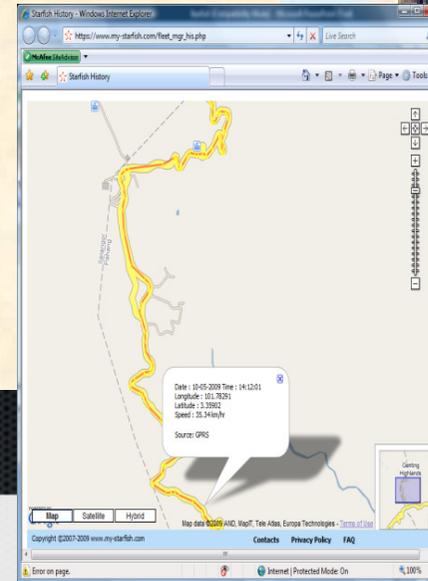
VEHICLE SECURITY SYSTEM



CAPTOR
RF GPS GSM

3 IN 1

VEHICLE TRACKING
&
RECOVERY SYSTEM



The Way Forward

- Ensure full capitalization of GNSS usage in country
- Participate in International works on GNSS applications and development
- Promote and Optimized GNSS infrastructure usages
- Intensify GNSS related R&D
- Encourage local GNSS industries development
- Encourage locally produced GNSS applications

THANK YOU