



Where am I?



Where am I? Who am I?

Slide 2



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- **Head of Geomatics and Metocean in BSP**
- **Fellow of the Royal Institution of Chartered Surveyors (FRICS):**
- **30+ years as a professional surveyor – land and hydrographic**

- **Qualifications:**
 - **University in London (HND in Land Surveying, BSc (HONS) in survey and mapping sciences)**
 - **MBA in Aberdeen, Scotland**
 - **PhD. Student at Universiti Teknologi Brunei**
 - **MSc (Category A (IHO/FiG/ICA) through Brest University (France))**



Where am I? What is Geomatics?

Slide 3



Definition of Geomatics as adopted by B.I.G.

“The art, science and technologies related to the management of geographically-referenced information. Geomatics includes a wide range of activities, from the acquisition and analysis of site-specific spatial data in engineering and development surveys to the application of GIS and remote sensing technologies in environmental management. It includes cadastral surveying, hydrographic surveying, and ocean mapping, and it plays an important role in land administration and land use management.”

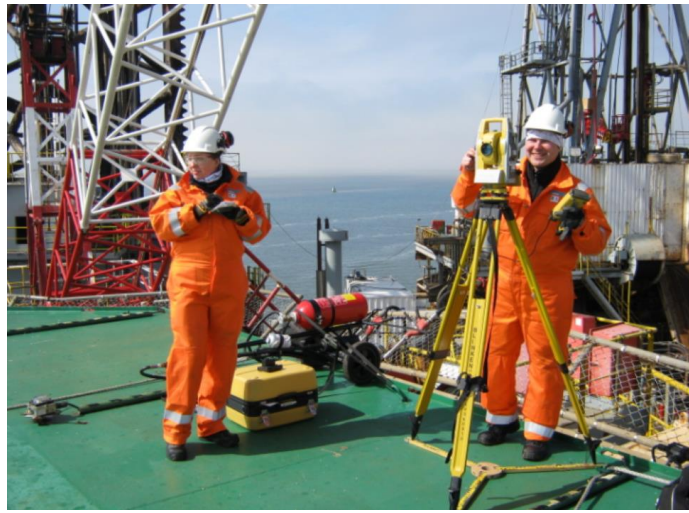
B.I.G. – Geographically referenced

Geomatics and geomaticians need to know where they are

AND

How that coordinate is defined (Geodetic Reference Frame)





On land:

Buildings, utilities and manmade features help us

Survey stations and benchmarks orientate us

The relative aspect between features and stations/benchmarks remains consistent and constant

Measurement tools (Total Stations, Sextants, Theodolites) make repeatability achievable





Navigators centuries ago were happy to achieve 10minutes of arc for major voyages
Solving the ‘Longitude problem’ with more precise clocks reduced that error
Evolution of radio and doppler positioning made global positions even more reliable
GNSS networks now cover the globe





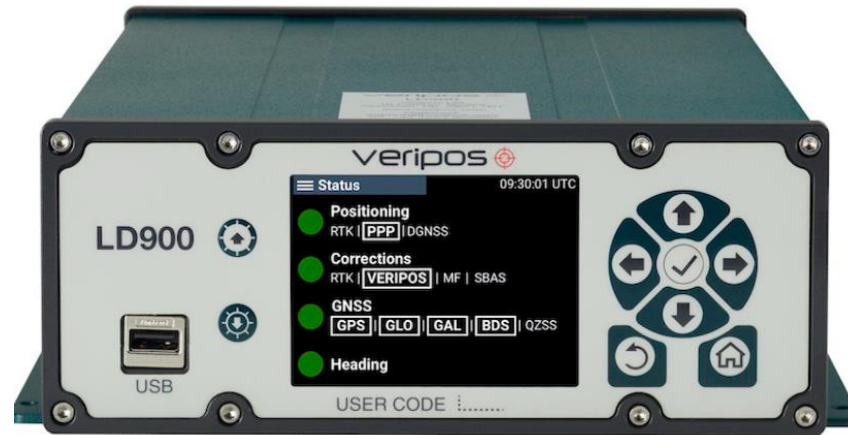
Long voyages maps were not important – only the sail line and star almanacs

Soundings were taken with great care, in particular in port and harbor areas

Charts and maintaining them with updates was a full-time job on some commercial vessels

Modern digital maps, and charts, now make the need to update easier. But no less important



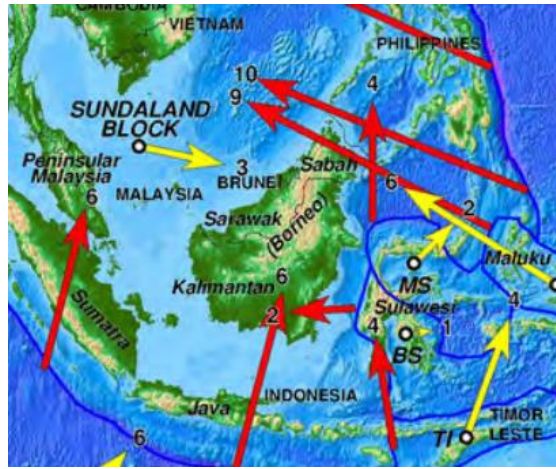


There is no doubt that GNSS (Global Navigation Satellite Systems) make the ease of navigating simpler

Smartphones with GNSS and a base map allow real time mapping without the need of a navigator

**Positional accuracy from the smartphone GNSS is a few metres – insignificant to the layman
To the Geomatician, a few metres (and to know that uncertainty) is not good enough**





The land on the earth surface moves – plate tectonics – Borneo upto 0.025m p.a.

A position calculated in 1982 could have the same latitude/longitude tagged to it, but that coordinate will be maybe 1 metre away using GNSS

Is this important: on land less so as the relative position to other marks remains the same – everything shifts at the velocity

Offshore, this is still the case, but there are no local landmarks available to reference to





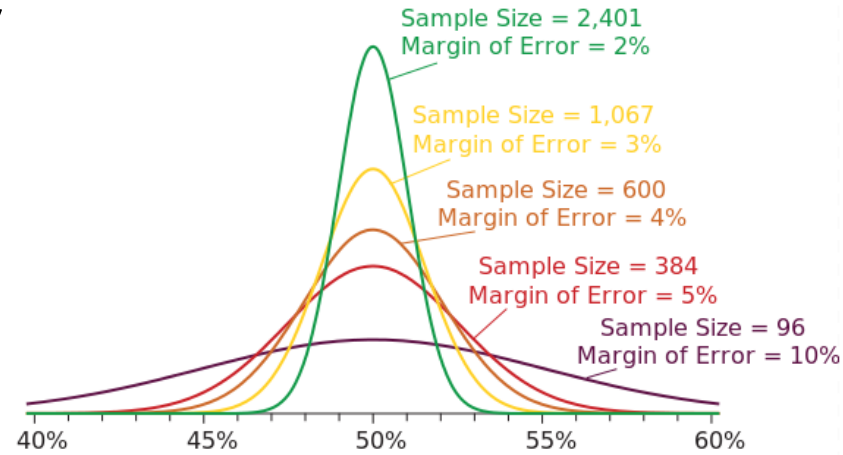
Some BSP assets have been in for decades. A well drilled in 1982 could have a coordinate tagged to it in error by 1metre

The coupling of updates in GNSS positions over time is critical

For platforms this is less important – the platform is physically visible

For subsea wells – it is critical as a vessel or rig will need to find that well





**My experience always guides me to error theory – random, systematic and gross error
Geomaticians need to KNOW these and how their measurements are influenced by their
actions in reducing (or estimating error)**

**Gross errors are generally avoidable – Systematic errors are reduced through calibration and
maintenance. Random errors are quantifiable**





Reducing error when moving a rig over a well is essential – verifying position, aligning gyrocompass, measuring offsets

All 'basic' activities but with a high degree of process

Checking and verifying colleagues work essential





Knowing where we are and how that position is defined is the cornerstone of a geomatician's focus

How that position is calculated and the accuracy is vital

Knowledge and application of error theory is essential

Checking and validating is still relevant today as it always has been for Geomaticians

Thank you to Rafidah in enabling this to happen 'virtually'!

