



جاينن اوکور
SURVEY DEPARTMENT
MINISTRY OF DEVELOPMENT
NEGARA BRUNEI DARUSSALAM



BRUNEI INSTITUTION OF GEOMATICS
(B.I.G.)
NEGARA BRUNEI DARUSSALAM

سيمينر اوکور تانه اساس قمباغونن

SEMINAR UKUR TANAH ASAS PEMBANGUNAN (UTAP) 2023
PROGRAM BOOK

Theme:

Seizing the Future: Geospatial Technology Optimisation

04 Rabiulawal 1445H
20th September 2023

The Centrepoint Hotel,
Abdul Razak Complex,
Bandar Seri Begawan

سيمينر اوکور تانه اساس قمباغونن

SEMINAR UKUR TANAH ASAS PEMBANGUNAN (UTAP)

Seizing the Future: Geospatial Technology Optimisation

Goldstone Ballroom, Level 7, The Centrepoin Hotel, Brunei Darussalam
04 Rabiulawal 1445H | 20th September 2023

MORNING SESSION

- 08:00** Registration of Seminar Participants
- 08:15** Arrival of Heads of Departments & Heads of Units/Divisions, Ministry of Development
Arrival of Deputy Permanent Secretary (Construction and Development Industry),
Ministry of Development, Yang Mulia Sr. Dayang Hajah Norhayati binti Haji
Mohammad Yaakub
- 08:30** Arrival of the Guest of Honour,
Acting Permanent Secretary (Planning, Land Use and Environment),
Ministry of Development, Yang Mulia Dayang Aldila binti Haji Mohamad Salleh
- 08:35** Recital of Surah Al Fatihah and Doa Peliharakan Sultan
- 09:00** Welcoming Remarks by Acting Surveyor General of Brunei Darussalam
Yang Mulia Dayangku Siti Saihalina Binti Pengiran Haji Ibrahim
Opening Speech by the Guest of Honour
Presentation of souvenir to the Guest of Honour
Keynote Address by Mr Gerry Ong
Honorary President ASEAN Federation For Land Surveying and Geomatics
Presentation of souvenir to keynote speaker
Group Photo Session
- 10:15-10:45** Refreshment Break

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10:45 Understanding Environmental Change Using Geospatial Techniques
by Mr Gabriel Yit Vui Yong, *Universiti Brunei Darussalam*

Developments in Geospatial Technology: Flood Modelling For Sungai Belait
by Mr Warwick Richard Newall, *Brunei Institution of Geomatics*

Tectonic Motion Brunei Darussalam: Analysis from 2011-2020
by Mr Muhammad Abdul Hadi bin Haseri, *Survey Department*

Q & A Session
Presentation of souvenir to presenters
End of morning session

12:15-13:30 Lunch Break

AFTERNOON SESSION

13:30 Arrival of Seminar Participants

14:00 Using LiDAR Data in Multipurpose Cadastre Development of Brunei Darussalam
by Mr Zulfadli bin Haji Mahadi, *Juruukur Fadly*

Laser Scanner In Action
by Mr Amy bin Wahid, *Brunei Shell Petroleum Sdn. Bhd.*

The Future of Land Surveying
by Mr Yong Teck Nyek, *Juruukur Bersatu Konsultan*

Q & A Session
Presentation of souvenir to presenters

Closing Remarks by Acting Surveyor General

Refreshment

End of Event

KEYNOTE SPEAKER

GERRY ONG

HONORARY PRESIDENT



ASEAN Federation For Land Surveying and Geomatics
Singapore

PROFILE

Gerry has been an appointment holder of ASEAN Federation of Land Surveying and Geomatics (AFLAG) since January 2008. He served multiple terms as ASEAN FLAG's Honorary Secretary General and in 2019 until 2022, he served as the President. Currently, Gerry serves as Honorary President and is also the lead for ASEAN FLAG's Climate Change & Sustainability working group.

During his professional career, Gerry is the founder and Managing Director of GPS Lands in Singapore. A company that has implemented several national infrastructure level projects with the Singapore Government related to GNSS Positioning Infrastructure for Smart Cities, Automated Plan Checking for Cadastral Surveys, Pointcloud Content Repository Management, High definition HD Maps for Autonomous Vehicle & Robotics Platform along with Smart Cities related pilot projects within the region of S.E.Asia.

Gerry is also a practising Registered Surveyor providing consultancy services and technology implementer of modern and advance systems within the engineering, construction and geospatial domains for both public and private sectors.

Our Professions Critical Role Within Climate Change Space

Abstract

Our professionals within AFLAG have served well their respective domains in the Government, Academia and Private sectors related to National Standards, Practices and Guidelines. It is our profession that regularly formulates and implements these requirements to cater to the ever-changing landscape of technology advancements and changing needs on the ground. A critical need facing humanity at the moment is the threat of Climate Change.

This presentation explores the important scopes our profession can contribute to the various stakeholders actively involved in Climate Change related initiatives and projects. It begins from the initial project feasibility studies stage supporting the Project Design and Development (PDD) phase. It follows through to the implementing of these projects to deploying advance technologies to support a traceable and transparent Digital Measurement, Reporting and Verification (DMRV) way of reporting and also in Carbon accounting (determining CO₂ equivalent values).

This presentation also touches on the required expertise and skills necessary in generating accurate spatial information for supporting evidence-based decision-making, and ensuring the effectiveness of climate change mitigation and adaptation efforts.

Our profession certainly has a lot to offer towards the success of every climate change related projects and even possibly working towards an ASEAN regional standard where guidelines could be crafted to cater to our regions needs.

GABRIEL YIT VUI YONG

SENIOR LECTURER



Universiti Brunei Darussalam
Negara Brunei Darussalam

PROFILE

Mr Gabriel Yong is a lecturer in the Geography, Environment and Development Programme at Universiti Brunei Darussalam. He has a BSc (hon) in Geological Geophysics (Reading, 1986) and a MSc in Environmental Analysis and Dynamics (Hull, 1998). Gabriel has been teaching modules on Brunei Darussalam's environment, environmental systems, environmental impact assessment, and biomimicry, among others for the past 25 years or so. He has been involved in regional projects aimed at utilising geospatial systems for environmental management, such as the ASEAN-Australian Coastal Zone Environmental and Resources Management Project (late 1990s) and the ASEAN Biodiversity Centre's Decision Support System for Coastal and Marine Environment (2022). Gabriel's main research interests include human-environment interactions from a complex system perspective and reconstruction of Brunei Darussalam historical geography.

Understanding Environmental Change Using Geospatial Techniques

Abstract

Environmental change is characteristic of nature. It is also an unavoidable consequence of development, an anthropogenic process of building the human habitat to continually improve the population's standard of living and potential for advancement. However, these changes have undesirable outcomes ('impacts') on certain communities. This has given rise to the field of environmental studies, including environmental impact assessment, modelling and management. All environmental studies have a spatial component, and are therefore reliant on geospatial techniques and technologies, especially with increasing scale of study. However, although geospatial and environmental professionals do collaborate and commonly refer to developments and outputs from the two fields, they tend to work and are often consulted separately. This is not optimal and can lead to missed identification and or misunderstanding of the environmental problem, because most geospatial professionals lack sound knowledge of environmental dynamics of specific areas, while environmental scientists generally are unable to capture, visualise and/or use geospatial data and technologies to improve their analysis. This paper will provide four examples of collaborative works using geospatial techniques to provide some ideas of how they enhanced understanding of environmental change. The techniques encompass innovative utilisation of InSAR data to low-tech, high-knowledge application of visual spatial analysis.

WARWICK RICHARD NEWALL

CHAIRPERSON OF PLANNERS SECTION



**Brunei Institution of Geomatics (B.I.G.)
Negara Brunei Darussalam**

PROFILE

Warwick is a senior town planner with over 30 years experience in urban development and infrastructure projects for private sector and governments in Australasia and South East Asia. He is currently Managing Director of KPI Sdn Bhd, a multi-disciplinary company undertaking planning, engineering, and environmental services for the Government of His Majesty in Brunei Darussalam, and in private sector he is working with several projects in Australia on Waste to Energy Schemes.

KEY EXPERIENCE

Initially employed by Wellington Regional Planning Authority in 1975, Warwick moved to Australia in 1979 to work with on urban design schemes, tourism and resort developments, university and technical college campuses, housing estates, and recreational parks. In 1993 he moved to Brunei with Australian Engineering Group, CMPS&F to work on the UBD Campus Masterplan, environmental management and oil spill contingency planning. In 1996 he became Managing Director of KPI Sdn Bhd, with overall responsibility for project delivery on flood mitigation schemes, mechanised rice irrigation projects, aquaculture and forestry projects, town planning schemes, and environmental impact studies. He remains committed to Brunei and its targets for achieving international benchmarks in environmental management.

CHRONOLOGY

1996 to present: Managing Director, Kejuruteraan dan Persekitaran Integrasi Sdn Bhd (formerly known as Integrated Environmental Consultants Sdn Bhd)
1993 to 1996: Senior Planner/Manager, CMP-Hamzah Sdn Bhd, Brunei
1992 to 1993: Sole Practitioner: Sitrine Landscapes (International Golf Courses), Sydney, Australia.
1987 to 1992: Associate, Tony Corkhill and Associates Pty Ltd
1985 to 1987: Planner/Landscape Architect Cox Corkhill and Associates Pty Ltd
1983 to 1985: Landscape Architect, EBC Landscape Architects Pty Ltd
1975 to 1979: Planning Assistant, Wellington Regional Planning Authority.

Developments In Geospatial Technology: Flood Modelling For Sungai Belait

Abstract

The United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) outlines five key drivers of GIS's growth: the availability of new data sources and analytical methods; technological advancements; evolution of user requirements; industry structural shift; and changes to the legislative environment. The Belait River Modeling for Kandol Rice Scheme illustrates adoption of several of the above drivers (Use of LiDAR, Disaster Prediction, Image/Raster Analytics) on a recent project in Brunei. The river flood modelling was undertaken in May to August 2019 for PWD Department of Drainage to provide flood frequency and flood levels for the proposed Kandol Rice Scheme.

Catchment mapping was completed using 2009 LiDAR topographic data from the Department of Survey. Landuse features were added from GoogleEarth Pro satellite images. TUFLOW is a 1D-2D linked hydraulic model which solves depth-averaged shallow water equations. The 4320-minute duration (3-day) flood event was found to be the critical event in the reaches upstream of the Bukit Puan Bridge and the design flows for the 1 in 100 year AEP event were adopted for the hydraulic model and to indicate flooding across the catchment, and to determine the flood mitigation design for the proposed Kandol Rice Scheme.

Other applications of the TUFLOW hydraulic model include: installation of remote river level sensors further upstream at Kg Sukang to enable prediction of the level of flooding for residents and operators of the Kandol rice scheme; re-running of the model for landuse planning scenarios in the Belait catchment; water resources management for industrial and domestic water supply; geo-hazard identification; emergency response planning (identify safe evacuation routes). The hydraulic model can be extended further downstream to include tidal influence factors and provide a useful tool for climate change impact planning.

MUHAMMAD ABDUL HADI HASERI SURVEYOR



Survey Department
Negara Brunei Darussalam

PROFILE

Hadi Haseri is a skilled professional in the field of surveying and geodesy with a strong academic background and diverse experience. He earned his Bachelor's degree from the University of Newcastle, UK, specialising in Surveying and Mapping Science. Hadi's career includes a range of roles, from his time as a Survey Technician to his current role as a Survey Officer in the Geodetic Unit at the Survey Department of Brunei Darussalam, where he conducts control surveys, monitors CORS stations, performed geodetic levelling, drone surveys, and data analysis - to his impactful position as an Adjunct Geomatics Lecturer at the Institute of Brunei Technical Education, where he crafted program modules and delivered enriching lectures. His notable achievements include securing the best presenter award at the 16th South East Asia Survey Congress, recognising his exceptional work on evaluating the local geoid in Brunei Darussalam. Additionally, he serves as the Chairperson of the Constitution and By-laws Committee for the Brunei Institution of Geomatics (B.I.G.), underscoring his commitment to the advancement of the geospatial discipline. Anchored by his profound interests in geodesy and terrestrial land survey, Hadi continues to contribute significantly to the evolution and application of precise geospatial measurement techniques.

Tectonic Motion of Brunei Darussalam: Analysis from 2011–2020

Abstract

Brunei Darussalam, situated in Southeast Asia on the northern coast of Borneo, experiences the complex interplay of tectonic forces that have shaped its geological history. Understanding the region's tectonic motion is vital for assessing geological hazards and improving geodetic frameworks. This study presents an analysis of the tectonic motion in Brunei Darussalam using data from Continuously Operating Reference Stations (CORS).

The CORS network, consisting of precisely positioned Global Navigation Satellite System (GNSS) receivers, provides high-precision and continuous geodetic data. This data allows for the detection and monitoring of crustal movements, including horizontal displacements and vertical velocities, with unprecedented accuracy. In this study, data from multiple CORS stations within and around Brunei Darussalam were analysed over nine years (2011 to 2020) to quantify tectonic motion patterns in the region.

The results revealed that Brunei Darussalam experiences relatively slow but significant tectonic motion due to its position within the broader Sundaland plate of about 2 cm/yr. The region's motion is influenced by the subduction of the Sunda Plate beneath the Eurasian Plate and the complex interactions with the Philippine Sea Plate. The observed horizontal displacements provide crucial insights into the relative movement of tectonic plates in the area, helping to better understand regional geodynamics and seismic potential.

Moreover, the vertical velocities obtained from the CORS data offer valuable information about subsidence and uplift patterns across Brunei Darussalam. Understanding these vertical motions is essential for studying sea-level changes, land subsidence due to groundwater extraction, and potential implications for coastal infrastructure and environmental management. The integration of CORS data with existing geological and geophysical models enhances our comprehension of Brunei Darussalam's tectonic evolution and its relationship with surrounding tectonic features. Such knowledge can aid in the development of improved geological hazard assessments, early warning systems, and geodetic reference frames for geospatial applications.

In conclusion, this study demonstrates the effectiveness of using the CORS network to analyse tectonic motion in Brunei Darussalam. The findings contribute to the broader understanding of regional tectonics and lay the groundwork for further research on seismic hazard assessments and geodetic studies in the country and the surrounding Southeast Asian region.

ZULFADLI HAJI MAHADI

OPERATION MANAGER



Juruukur Fadly
Negara Brunei Darussalam

PROFILE

Zulfadli Mahadi is a Licensed Land Surveyor candidate, graduated with Bachelor of Geomatics Engineering. Zulfadli have been working as Juruukur Fadly's Operation Manager and Surveyor for the past 8 years. His daily working routine includes monitoring, supervising and checking both production and deliverables of the company. Managing day-to-day activities of employees and measuring the staffs's performance. Zulfadli shared the same principle as his dear father, a profound and experienced Geomatician in Brunei:

"Enhancing our governance and compliance systems, continually strengthening our skills according to the latest Industrial Revolution 4.0 technology through ongoing training and development to deliver top-quality results continuously as well as make the best use of the local workforce and utilize local goods and services in Juruukur Fadly's activities."

Since Zulfadli joined Juruukur Fadly, the company has now grown to employing 26 technical staffs and 17 non-technical staffs. All of them are local Bruneians, 90% of which aged 30 and below. His diligence and strong beliefs in expanding the knowledge and skills to further bring efficiency in the equation are reflected in the positive light towards the employees of Juruukur Fadly which has been heavily involved in multiple successful projects throughout the years.

This paper is done by Zulfadli, Operation Manager, Abdul Haniff Salleh, Project and Technical Manager, Syaakiirroh Sahari, Afiqah Ahim and Marazieah Fatin Afiqah – aspiring young professionals in Geoscience, Geography and Environment background, all graduated from Universiti Brunei Darussalam.

Using LiDAR Data in Multipurpose Cadastre Development of Brunei Darussalam

Abstract

Survey accurate Multi-Purpose Cadastre (MPC) is a spatially enabled system that integrates land information system which contains conventional cadastre information, topography, man-made features and cultural (e.g., land use, demographics) information in an accurate reference framework. MPC has an enormous potential to support the government and private sectors, as well as the society in general. MPC will also be able to increase computer support in the process of spatial visualization, organisation, and administration of important and valuable land information. MPC will be based on four main applications of Geographic Information System (GIS): Infrastructure, Environment, Social and Economic. Consequently, MPC will be a foundational data asset essential to decisions involving geospatial database, with the potential to help drive regional economic growth and hence gearing the nation towards having an economy that is dynamic and sustainable by year 2035. It is truly multipurpose since it does not only receive information and data from many sources, but it also provides reliable services and products for many purposes and to many users. LiDAR (Light Detection and Ranging), data is crucial especially for a developing country like Brunei Darussalam. Data from LiDAR processing includes the generation of multi-dimensional buildings – Level of Detail 2 and Level of Detail 3 as well as large scale topographical maps. These data, if utilises correctly, will be very valuable and beneficial in the generation of MPC.

AMY WAHID

GEOMATICS ONSHORE OPERATION

Brunei Shell Petroleum Sdn Bhd
Negara Brunei Darussalam

PROFILE

Amy Wahid's professional background covers onshore survey operations for more than 15 years evolving around topographical survey via satellite-based acquisition techniques & remote sensing. This includes managing risk in operations and contract services. He witnessed the Geomatics Industry's journey from services oriented to consultancy values due to the spatial component contributing to decision making. Passionate for spatially enabled technology that complements Geomatics such as Ground Penetrating Radar, Light Detection and Ranging, Unmanned Aerial System.

Enjoys leisure walk and recreational biking during off-days.

Laser Scanner in Action

Abstract

In the last decade, the industry was shaped by technology advancement in spatially enabled equipment and tools that has proven to be a game changer in rapid data acquisition for our geomatics profession. In the conventional sense, data acquisition techniques has improved significantly within a shorter timeframe. 3D laser scanner in principle uses laser light emission and return signal to measure precise distance. Other aspects such as HSSE exposure and labour intensive exercise had also contributed to improvement in acquisition. The technology for laser scanner, takes into account cloud point representing distance from scanner. In the earlier days, geomatics role of measurement on tank outer shell feature depicting integrity (bulge or depression) via mean of ruler-based measurement lowered to represent the outer shell. In another example, dimensional survey challenges placement of targets to shoot from total station calculating bearing and distance to illustrate alignment and measurement between 2 points. Laser Scanned data features has proven to be of huge benefits for end user due to the very precise, redundancy of the data visualization, enabling key decision making enormously proven to be a game changer for the 'cloud' data.

YONG TECK NYEK

SURVEYOR



Juruukur Bersatu Konsultan
Negara Brunei Darussalam

PROFILE

Yong Teck Nyek is currently a Licensed Land Surveyor and the Managing Director of Juruukur Bersatu Konsultan (also known as JBK). He is a Fellow of the Brunei Institution of Geomatics (B.I.G.).

He holds a BSc Degree in Geomatics Engineering from the University of New Brunswick, Canada. Prior to joining JBK, he worked for Brunei Survey Department from 1986 to 1995.

He has been providing survey services to both public and private sectors throughout the country. He makes a major commitment to new surveying technologies and takes pride in his ability to provide the highest quality, well-timed and competitive surveying services by incorporating state-of-the-art surveying equipment and computer technology into the completion of the projects.

Future of Land Surveying

Abstract

Geomaticians (or also known as land surveyors) are professionals involved in an integrated approach to the measurements and interpretation of data about areas of land, including information of boundaries, buildings and both natural and man-made features.

The tools and techniques used include land surveying, remote sensing, cartography, geographic information systems, global-navigation satellite systems, photogrammetry, geophysics, hydrography, geography, and related forms of earth mapping.

Advancement in technologies and techniques help to increase the speed, scope and accuracy. From chain surveying to LiDar and human to Artificial Intelligence, the latest evolution of technology has impacted the design and function of Geomatics in a massive way and fresh impact is yet to come.

Moderator

Abang Mohammad Syazwan
Abang Abas
District Surveyor



Muhammad Abdul Hadi
Haseri
Surveyor





Appreciation



Jabatan Penerangan
Jabatan Perdana Menteri



Radio Televisyen Brunei
Jabatan Perdana Menteri



Committee Members

Advisor

Nor Zetty Akhtar binti Haji Abdul Hamid

Chairperson

Abdul Malik bin Haji Abdul Hamid

Secretaries

Haji Muhammad Hifney bin Haji Abdul Rahman

Hajah Nona Lieza binti Haji Yahya

Deputy Secretaries

Mohammad Iman Budiman bin Haji Aspar

Cecilia Tan Yee Wen

Treasurer

Siti Nurbaya binti Haji Abdul Latip

Muhammad Hanif Jafri bin Hosni

Pengiran Sofian bin Pengiran Omar

Opening and Master of Ceremony

Pengiran Mohammad Norhashimi bin Pengiran Haji Bungsu

Abang Mohammad Syazwan bin Abang Abas

Haji Zool Hilmi bin Haji Matahir

Siti Noor Ramziah binti Noor

Dayangku Nur Maseleia Zanariah binti Pengiran Ibrahim

IT Logistics

Pengiran Masnah binti Pengiran Haji Ahmad
Muhammad Zul Fadly bin Haji Abdul Halim
Pengiran Haji Yahya bin Pengiran Haji Metassan
Muhammad Amirul Ariffin bin Kamis
Mohd Addyzul Muta'affif bin Abdul Warith@Haji Md Rosanan

Logistics and Transportation

Nuralif bin Jasni
Muhammad Shafiq bin Haji Ahmad
Zunaidi bin Haji Apong
Kasmani bin Sukirman
Haji Erin bin Haji Musli
Haji Muhammad Asyraf bin Mahat
Sani bin Haji Mahmuddin
Hasneel Hairul bin Haji Matassan
Arzmi bin Tahir
Abdul Wafi bin Ramle
Osman bin Haji Piut
Ashawan bin Mohammad Yusof
Jumat bin Haji Daud
Abu Safian bin Haji Mohammad
Haji Zulkaimi bin Haji Kinin
Awang Ahmad bin Tamin
Pengiran Mohammad Suffian bin Pengiran Mohammed Said

Media, Publicity and Photographer

Willyza Bibiana binti Ibrahim
Serina Alyssa binti Udan
Mohammad Aisamuddin Bin Daud
Awang Muhammad Su'ud Fikri bin Haji Iskandar
Pengiran Sallehuddin bin Pengiran Hashim

Program & Papers (UTAP)

Norhazemah binti Kalong
Muhammad Abdul Hadi bin Haseri

Refreshment

Hajah Aierna binti Haji Bakar
Nur Aliyan binti Abdul Hadi Lim
Norlina Sariy binti Awang
Maslila binti Haji Matali

Registration, Invitation and Guest Coordinator

Sarra Soffiya binti Haji Abdul Rahman
Rozyinah binti Haji Patra
Aisah binti Kamis
Haji Mohammad Eddy Iswardi bin Bangok
Hajah Zarinah binti Haji Gustin
Siti Nurhanani binti Awang Hassan
Anisma Khairunnisa Nabilah binti Awang Osman
Siti Juliana binti Haji Mohammad Salleh
Hajah Nur Hamizah binti Haji Saidin

Souvenir

Hajah Yusnidah binti Haji Md Yusuf
Hajah Noordina binti Haji Abdul Jalil
Syamimi binti Abdullah Hoh
Wardiah binti Haji Sharbini
Janatulaisah binti Abdullah

Safety and Accomodation

Haji Muhammad Khairul Hafizuddin bin Haji Shamsudin
Noor Azlin bin Haji Mohammad
Ilham Hidayat bin Haji Hussain
Zaini bin Tumih
Muhammad Fakhri bin Ismail
Haji Mohammad bin Haji Junid
Haji Yusry bin Haji Salleh
Safwan Amaluddin bin Sabli
Noor Azadah binti Haji Nawe
Bahrin bin Haji Ibrahim
Nur Rabi'atul Rafiah bte Haji Abdul Warith/Lambagong
Mazlenda binti Haji Abdul Manan
Muhammad Hisyam bin Haji Puasa
Pengiran Muhammad Nur Syafiq bin Pengiran Besar

Invitation and Protocol

Haji Khairul Abidin bin Haji Sulaiman
Haji Asrahwi bin Haji Ahmad Bujang
Dayangku Azianty binti Pengiran Haji Othman
Muhammad Haziq Hadi bin Haji Mahadi
Hajah Siti Norashikin binti Haji Abdul Hamid
Hazirah binti Mohamad

