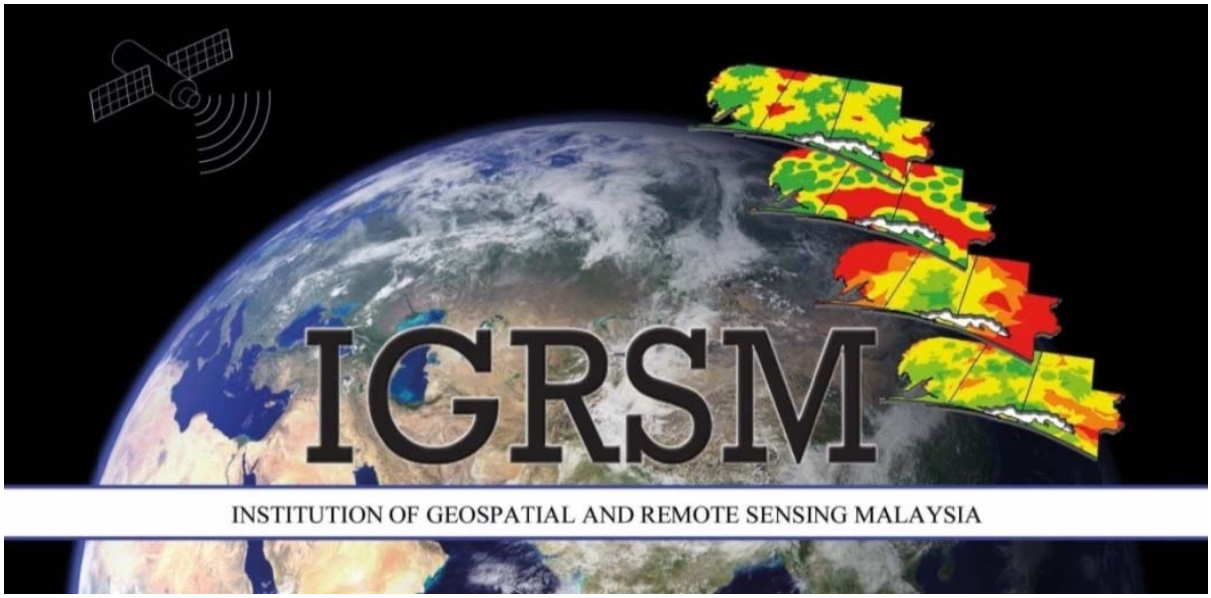

Technical Forum Series 2022 / 2 on Postmortem of Recent Flood Incidents: Focus on the Role of Geospatial & Remote Sensing in Disaster Preparedness and Prevention

12 April 2022 (Tuesday), 9.00 am - 12.00 pm

Online via Zoom

Link: https://us02web.zoom.us/j/83691369726?pwd=d0FORUVGNm5obC9RQ0tRSUtPdXh2UT09
Meeting ID: 836 9136 9726
Passcode: 090994

Organisers

IGRSM
INSTITUTION OF GEOSPATIAL AND REMOTE SENSING MALAYSIA

IEEE GRSS MALAYSIA Geoscience and Remote Sensing Society

UPM UNIVERSITI PUTRA MALAYSIA BERILMU BERBAKTI

seadpri southeast asia disasterprevention research initiative

Ministry of Defence Malaysia

SCIENCE & TECHNOLOGY RESEARCH INSTITUTE FOR DEFENCE (STRIDE)

Flood Hazard Mapping in Support of Engineering Design for Infrastructure Development

Wan Hazdy Azad bin Wan Abdul Majid

Senior Assistant Director, Drainage & Irrigation Department (DID)

Aplikasi Data Geospatial dan Penderiaan Jauh Dalam Kajian Kejadian Bencana Geologi Tanah Runtuh dan Aliran Debris di Gunung Jerai, Kedah

P.Geol. Wan Salmi bin Wan Harun

Penolong Pengarah Kanan, Jabatan Mineral & Geosains Malaysia (JMG)

Usage of UAS for Flood Management

Captain Illyaquila Fateen bt Ismail

Head, UAS Unit, Civil Aviation Authority of Malaysia (CAAM)

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Abstract

Floods are considered as the most common life-threatening natural disaster in Malaysia. They occur almost every year, especially during the monsoon seasons and cause more economic losses than other natural disasters. The widespread flooding in December 2021 that affected many states in Malaysia was caused by heavy rainfall that is more than one-in-a-100-year average recurrence interval due to a tropical depression. The Government of Malaysia via the Department of Statistics reported that overall losses due to the recent floods is about RM 6.1 billion (USD 1.46 billion). The availability of flood hazard maps to identify areas at risk will be beneficial and play an important role in decision-making, planning and implementing flood management. A study by the Department of Irrigation and Drainage (DID) showed that 10.1% of land area in Malaysia is prone to floods, thereby affecting approximately 5.7 million of the population. The annual average damage due to floods is estimated to be RM 36 billion (USD 9 billion).

Two main causes of major floods are land-use change and urbanisation. These two factors frequently alter the natural state of rivers by changing alluvial channels to non-alluvial, which results in accelerated flows, bank overflows, and eventually flooding of major towns and cities. Structural and non-structural solutions have been incorporated in the government's strategy to reduce flood damages. Prior to 2000, flood management was primarily through structural measures, which are costly but do not necessarily provide a comprehensive solution to flood issues. This approach not only requires more land space, but also disrupts natural flows and destroys natural wildlife habitats. In addressing the limitation of structural measures, DID has introduced four overarching strategies namely: (i) Making room for water; (ii) Building with nature; (iii) Creating resilience; and (iv) Bringing back the beaches.

This paper highlights the first strategy – making room for water, which introduces a natural approach that reconnects rivers with their natural floodplains. Flood-susceptible areas can be derived from flood hazard maps produced through two-dimensional (2D) hydrodynamic modelling and good geospatial data. The 2D flood-routing models are able to demonstrate flood-plain dynamics and, when driven by good data, are reliable tools for evaluating floods. Subsequently, a flood hazard map using GIS tools can then be produced to show the extent and depth of inundation that in turn facilitates the planning of flood protection schemes. This approach enables holistic water management on a catchment scale and enables designs that preserve the natural environment. In the continuing shift from engineered solutions towards more holistic methods of managing flood risk, spatial planning has become essential to resolve the conflict between land and water, and correspondingly, water and people. In attempting to strike a balance between making room for water and making space for people, compromises are required.

Biography

Mr. Wan Hazdy Azad bin Wan Abdul Majid is a Senior Assistant Director in the Drainage & Irrigation Department (DID). He is an expert flood engineer with significant experience in working on various aspects of floods, including mitigation, modelling, as well as risk and damage assessment. He has worked on a variety of projects including flood mitigation planning, flood hazards and the National Flood Forecasting System.

Aplikasi Data Geospatial dan Penderiaan Jauh Dalam Kajian Kejadian Bencana Geologi Tanah Runtuh dan Aliran Debris di Gunung Jerai, Kedah

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Abstrak

Kejadian bencana geologi tanah runtuh di Gunung Jerai, Kedah telah berlaku pada jam 3.00 petang, 18 Ogos 2021 selepas hujan lebat berterusan yang luar biasa di kawasan Gunung Jerai dan sekitarnya sejak pukul 1.00 tengah hari. Data-data yang sedia ada digunakan seperti data Interferometric Synthetic Aperture Radar (IFSAR) dan tafsiran imej UAV yang ditentusahkan di lapangan bagi mengenalpasti lokasi, jenis tanah runtuh dan sungai-sungai yang berisiko mengalami kejadian aliran puing pada masa akan datang. Sejumlah 128 tanah runtuh dan enam aliran puing dalam pelbagai saiz telah dikenalpasti. Zon Bahaya, Zon Kawalan dan Zon Impak Tanah Runtuh juga telah dihasilkan yang dijadikan asas bagi pengurusan bencana oleh pihak berkuasa tempatan dan negeri untuk komuniti sekitar kawasan ini. Curahan hujan lebat dan berterusan di luar kebiasaan berlaku di bahagian puncak Gunung Jerai dan ia bertindak sebagai faktor pencetus dalam kejadian tanah runtuh dan aliran puing. Kadar purata curahan hujan ini yang dikategorikan sebagai lebat adalah 281 mm dalam masa 6 jam di Stesen Gunung Jerai dan 175 mm dalam masa 5 jam di Stesen Singkir Genting. Faktor geologi dan geomorfologi pula telah memainkan peranan penting dalam menyumbang kepada kejadian tanah runtuh dan aliran puing. Morfologi cerun yang cekung serta sempit, kecuraman cerun melebihi 25° dan ketebalan tanah baki yang cetek kurang daripada 2 m menyebabkan berlakunya tanah runtuh jenis aliran.

Biografi

P.Geol. Wan Salmi bin Wan Harun, telah menerima Ijazah Sarjana Muda Sains (Geologi Gunaan) dari Universiti Malaya pada tahun 1997, serta Sarjana Geofizik Kejuruteraan dan Persekitaran dari Universiti Kebangsaan Malaysia pada tahun 2015. Beliau berkhidmat sebagai Penolong Pengarah Kanan, Aktiviti Geologi Kejuruteraan di Jabatan Mineral & Geosains Malaysia (JMG) Negeri Terengganu. Di antara anugerah dan pengiktirafan yang diterima oleh beliau termasuk jurulatih berkepakaran tinggi dalam bidang bencana geologi (sub-bidang geologi tanah runtuh); ahli pasukan dan pakar rujuk untuk sistem NaTSIS (*National Terrain and Spatial Information System*) dalam Projek Penghasilan Peta Bahaya dan Risiko Cerun (PBRC); pakar rujuk dalam kumpulan kerja berkaitan sukatan kompetensi kumpulan teras geologi kejuruteraan dan bencana geologi; serta Ketua Kluster Geologi Tanah Runtuh dalam Kumpulan Teras Geologi Kejuruteraan dan Bencana Geologi. Beliau mempunyai pengalaman yang luas dalam pemetaan geologi kejuruteraan zon bahaya bukit batu kapur; serta siasatan bencana geologi, termasuk tanah runtuh, tanah mendap dan lubang benam.

Usage of UAS for Flood Management

Captain Illyaquila Fateen bt Ismail

Head, UAS Unit, Civil Aviation Authority of Malaysia (CAAM)

Abstract

Malaysians were caught by surprise by the torrential downpour, caused by Tropical Depression 29W, throughout the peninsula for three days from 17 to 19 December 2021, resulting in peak daily rainfall of 363 mm (14.3 in), equivalent to a month's worth of rainfall in the worst affected region, Selangor. The deadliest tropical cyclone-related disaster to hit Malaysia had demonstrated that the nation was ill prepared to respond to the crisis.

Unmanned aircrafts were deployed to gather critical information such as directional water flow; to identify, reach and rescue stranded flood victims; as well as determine effective evacuation plans, including prioritising rescue routes, especially in worst-hit areas. However, unmanned aircraft operations are required to be assessed by the relevant agencies to ensure that the initial plan to help the flood victims does not backfire by creating threats to airspace users, in particular helicopters and manned aircrafts that are also there for disaster relief, or through poor planning, competency and risk assessment by unmanned aircraft system (UAS) operators, create hazards to people on the ground that were initially intended to be saved.

The Civil Aviation Authority of Malaysia (CAAM) urges proper planning prior to the next flood season to ensure that UAS that are being deployed for the Rakyat, are SAFE for the RAKYAT.

Biography

Captain Illyaquila Fateen bt Ismail has more than 15 years of experience in the aviation sector, and is rated on the Airbus 320 and Airbus 330 fleets with over 8,000 flying hours. She elected to join the Civil Aviation Authority of Malaysia (CAAM) under a secondment programme in 2019, where she is currently serving as the Head of the UAS Unit and Flight Operations Inspector (FOI). Her roles and responsibilities as the Head of the UAS Unit include being responsible to the Director of Flight Operations to enable growth and integration of unmanned system technologies, advance safe unmanned civil aviation, as well as protect civil aviation operations against irresponsible users of these technologies by ensuring each functioning officer fulfils the group's responsibility. Her primary functions as a FOI involve inspecting, assessing, reporting and making recommendations to each operator, and is responsible for managing the operators' oversight on behalf of CAAM.