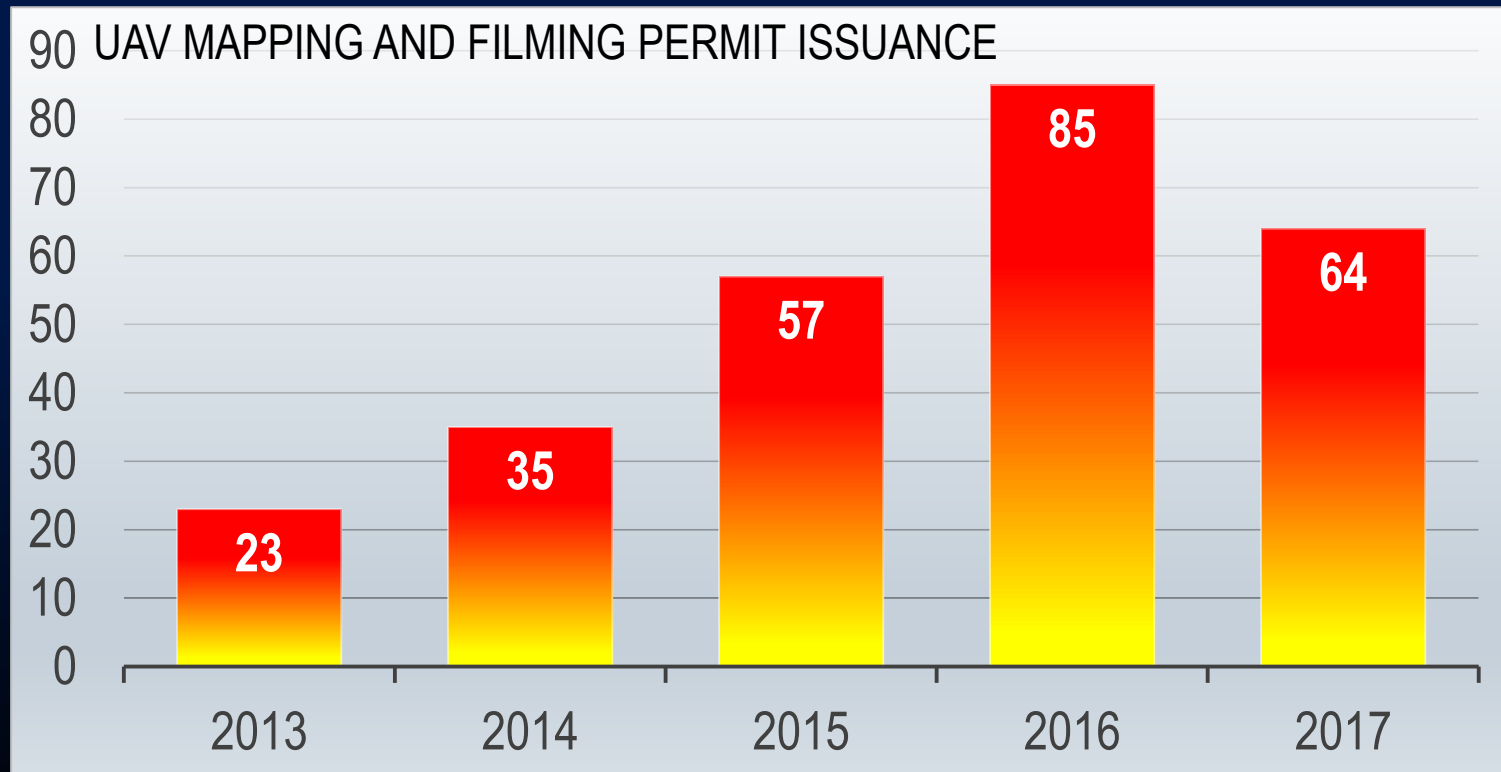


GEOSMART ASIA 2017

**IMPLEMENTATION OF UAV'S IN
JUPEM-LEGISLATION,
OPERATION, TRAINING AND
PLANNING**

OVERVIEW

- UAV's ability to make mapping and aerial photography increasing - cost cheaper, more accurate, RTK technology and improved payload.



UAV IN DEPARTMENT SURVEY AND MAPPING MALAYSIA

FIXED WING



Pteryx Pro

Endurance –90 min
Take off – Catapult dan hand launch
Landing –Belly landing dan parachute
Payload – RGB Camera



Sensefly eBee RTK

Endurance –40 min
Take off – hand launch
Landing –Belly landing
Payload – RGB Camera

ROTOR WING



UAV Swissdrone Dragon 50

Endurance –120 min
Take off and landing– VTOL
Payload – Metric Camera 60MP
MTOW – 85 kg



Quadcopter.

Endurance –40 min
Take off and landing– VTOL
Payload – Video
MTOW – 5 kg

Hexacopter

Endurance –40 min
Take off and landing– VTOL
Payload –RGB Camera
MTOW – 7 kg

MICRO UAV ADVANTAGES



- Lightweight and easy to handle.
- High precision products and meet the needs of 1:10 000 scale topographic maps.
- Updated small area.
- Low operating costs.
- There is no need of control points with RTKnet technology.
- At least 50m runway.
- Attempting to operate the diameter of the base station 3km



LEGISLATION SECURITY ENCROACHMENT



UAV ENCROACHMENT AT KLIA ON MARCH 2015

- Encroachment can occur without legal security
- Be convicted of the Civil Aviation Act 1969, the Official Secrets Act 1972 (Act 88) Section 4 and Section 7.



LAWS OF MALAYSIA

REPRINT

Act 88

OFFICIAL SECRETS ACT 1972

Incorporating all amendments up to 1 January 2005

PRINTED BY
THE GOVERNMENT OF MALAYSIA
AT THE GOVERNMENT PRINTING OFFICE
KUALA LUMPUR, MALAYSIA
1972

Prohibition of taking or making any document, measurement, sounding or survey of or within a prohibited place

4. (1) If any person takes or makes any document, measurement, sounding or survey of or within a prohibited place, he shall, unless he proves that the thing so taken or made is not prejudicial to the safety or interests of Malaysia and is not intended to be directly or indirectly useful to a foreign country, be guilty of an offence punishable with imprisonment for a term not less than one year but not exceeding fourteen years.

Prohibition from carrying photographic apparatus

7. (1) If any person within any prohibited place carries or has in his possession or under his control any photographic apparatus otherwise than with lawful authority or for a lawful purpose he shall be guilty of an offence punishable with a fine not exceeding two thousand ringgit or imprisonment for a term not exceeding one year or with both.

DCA

- DCA - Aeronautical Information Circular (AIC) 4/2008 Unmanned Aerial Vehicle (UAV) Operation in Malaysian Airspace.
 - 2.2 Approval of the flight by the DCA.
 - 5- Approval of Airworthiness Certification for the UAV that weighs more than 20kg
 - 7- Operator Qualification for UAV Commander and UAV pilot holds a Private Pilot Licence (PPL).
- Improvement:
 - Registration regardless of weight.
 - Airworthiness Certification for UAV revealed to 7kg.
- Approved NOTAM.



GENERAL CIRCULAR NO. 1 OF 2007 SECURITY INSTRUCTIONS GEOSPATIAL DOCUMENTS

- Permit mapping or aerial photography activities using UAVs.
- Monitoring process every UAV activity.
- Submission of data after the activity implemented for security screening.
- Permit of using geospatial product.





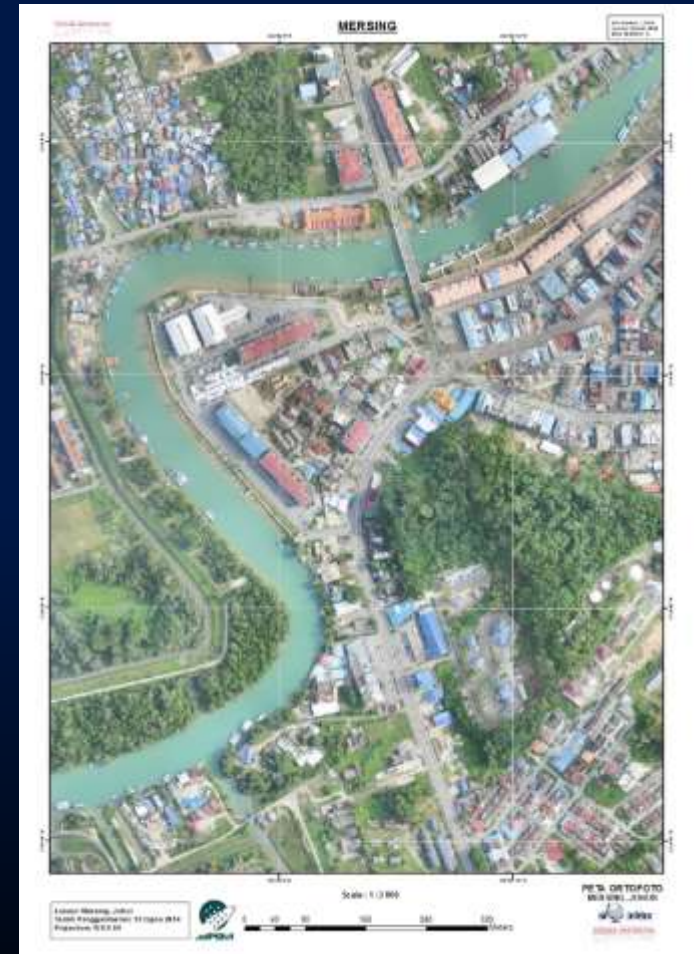
JUPEM UAV
CAPABILITY

- **Orthophoto Map**
- **Positioning**
- **Natural Disaster**
- **Video Surveillance**

OUTCOME ORTHOPHOTO MAP



Orthophoto Map, Pulau Indah,
Pelabuhan Klang, Selangor
9 Feb 2016



Orthophoto Map, Mersing
13 Okt 2015

BAUXITE MISSION



Aerial photography
environmental
pollution bauxite
Kuantan, Pahang
January 20, 2016



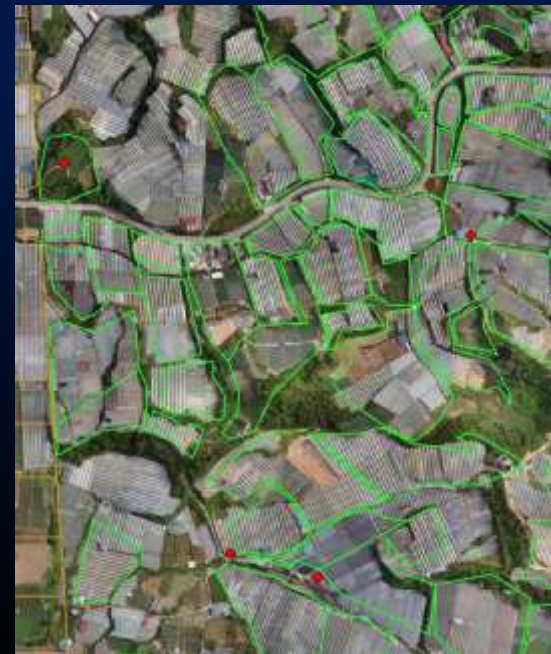
Orthophoto Map
Kuantan Port
18 Feb 2016

MISSION : TIMAH TASOH DAM

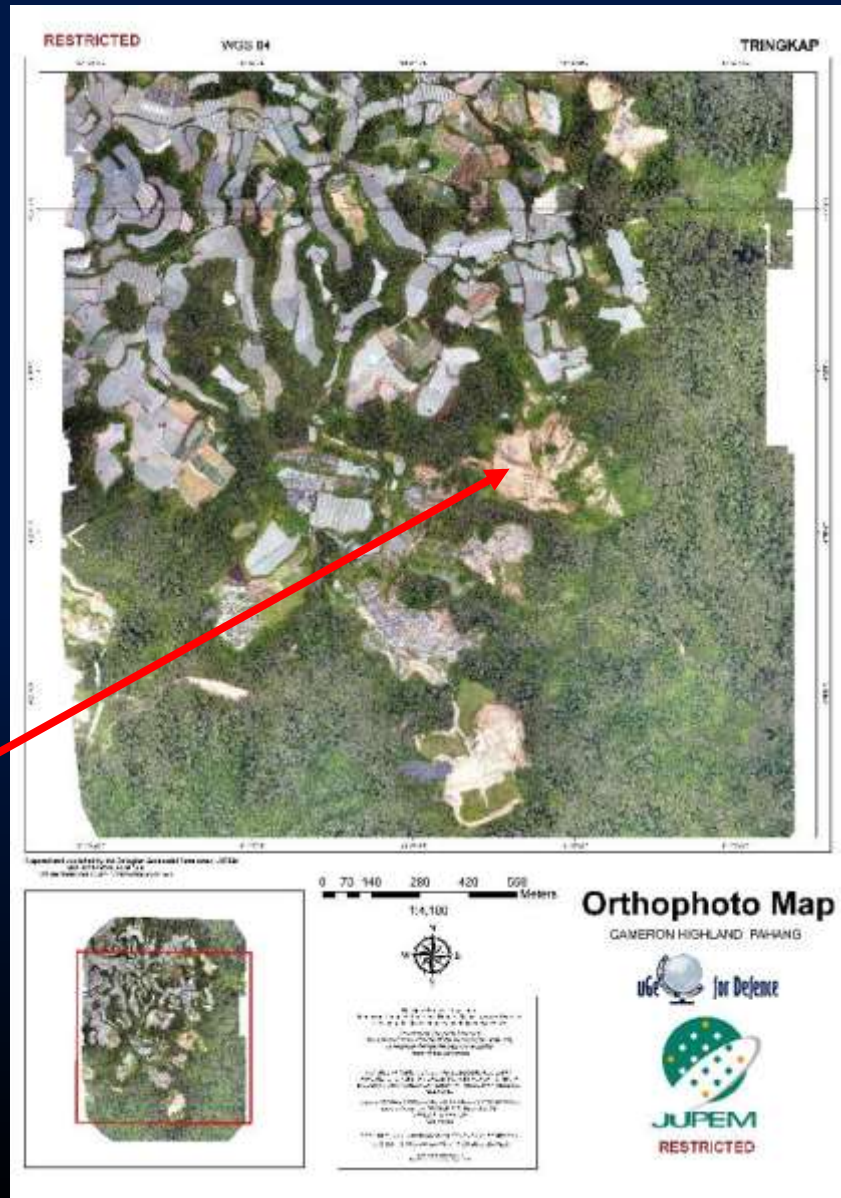


POSITIONING

- Positioning of the land border for legislative purpose.
- Orthophoto map can be overlaid with cadastral lots.



OP GADING 2



NATURAL DISASTER

- JUPEM has implemented aerial photography during natural disasters following location :
 - Flooded areas in Kuala Lipis and Temerloh, Pahang – Jan 2015.
 - Monitoring the effects of El Nino in the Beris Dam, Kedah and Timah Tasoh Dam, Perlis – May 2016.
 - Monitoring the effects of flash floods in Ulu Telom, Cameron Highlands – Jun 2016.
 - Monitoring the high tide in Kapar, Klang – Okt 2016.

NATURAL DISASTER



Flash flood at Ulu Telom,
Cameron Highlands
2 Jun 2015



Monitoring the impact of el Nino at Timah Tasoh Dam,
Perlis - 12 Mei 2015




Flooded area in Temerloh, Pahang at 8 Jan 2015

NATURAL DISASTER ORTHOPHOTO MAP

RESTRICTED WGS 84



Orthophoto Map
CAM-100N HIGH RES, PHRANG



JUPEM
RESTRICTED

Information on this map is for reference only. It is not to be used for navigation. The user is responsible for the accuracy of the information. The user is advised to check the accuracy of the information before using it. The user is advised to check the accuracy of the information before using it.



VIDEO SURVEILLANCE



UAV surveillance video at
Blue Valley, Cameron Highlands



UAV surveillance video at
Sg Merah, Cameron Highlands

UAV TRAINING

- More than 20 kg
 - Private Pilot License (PPL) Ground
 - OEM Operating and Maintenance Training.
- Below 20 kg
 - OEM Operating and Maintenance Training

UAV TRAINING

Private Pilot Licence Course (PPL) at Malaysian Flying Academy, Batu Berendam, Melaka 27 Okt-14 Nov 2014



Swissdrone Dragon 50 Image Processing Course



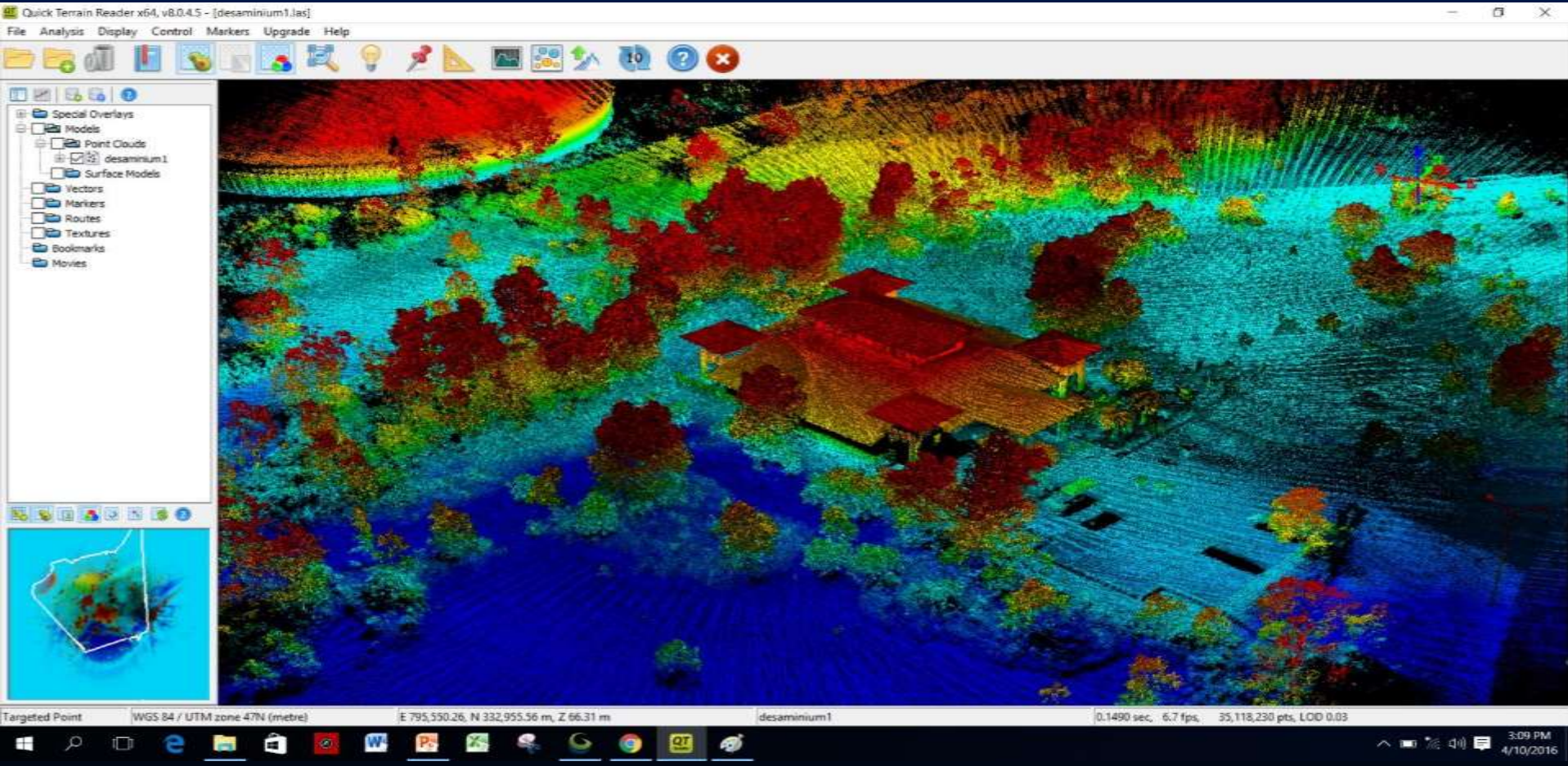
OEM TRAINING



**Pteryx Pro Advanced Course
Trigger Composites, Grodzisko Dolne, Poland**

PLANNING UAV MULTI SENSORS





ANALYSIS

- UAVs can produce DSM data and other applications such as volume calculations.
- UAV is able to produce high resolution images
- Operation can be set quickly.
- Can assist in making arrangements quickly



LESSON LEARNT

UAV is just a tool for taking images ;

- Very sensitive.
- It relies on GPS satellites.
- Terrain height information.
- Continuous training



THANK YOU