

# Geographic data & Earth Observation for Monitoring: UAS segment

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## Abstract

The GEOM project aims to help companies and organisations to explore, develop and implement new technologies using remotely sensed data. As part of the project, QinetiQ and Aberystwyth University are providing UAS-based surveying and end user products to various partners within the project where such data will enhance or economise their current survey practices. A principal part of the surveying will be the development of regular Beyond Visual Line of Sight (BVLOS) surveying protocols making this a viable method for regular commercial use.

## QINETIQ

- Test and evaluate the effectiveness and safety of a whole range of land, sea and air equipment for government and equipment manufacturers

## GEOM overview

The **Geographical data & Earth Observation for Monitoring (GEOM)** is a **Welsh European Funding Office (WEFO)** funded project to support research and innovation within the geospatial sector in Wales. More specifically, the project aims to provide a framework for developing end-user mapping products based on remotely sensed data, stimulating the use of such data amongst private and public sectors and further development of the geospatial industry within Wales.

The project is led by **Aberystwyth University (AU)** partnered with **QinetiQ**. QinetiQ are to provide the **Unmanned Aerial System (UAS)** – based data and engagement within the project

## The UAS platform

C-Astral Bramor PPX



- 3hrs endurance
- 15 km<sup>2</sup> range
- Sensors  
RGB, CIR, MS (red-edge), Thermal IR
- Typical performance 1hr per 60ha, per sensor

## 3 survey product levels:

- **Level 1 Data**  
Ortho-rectified imagery (from any of the cameras), Point Clouds (PCL) and Digital Surface Models (DSMs) with the option of including the raw captured data consisting of original photo and GNSS readings for each photo.
- **Level 2 Data**  
Calibrated surface reflectance imagery from the MultiSpectral (MS) camera and classified point clouds.
- **Level 3 Data**  
Any mapping product derived from the above data, such as landcover maps (vegetation species, urban infrastructure types), vegetation health maps or hydrological modelling outputs.



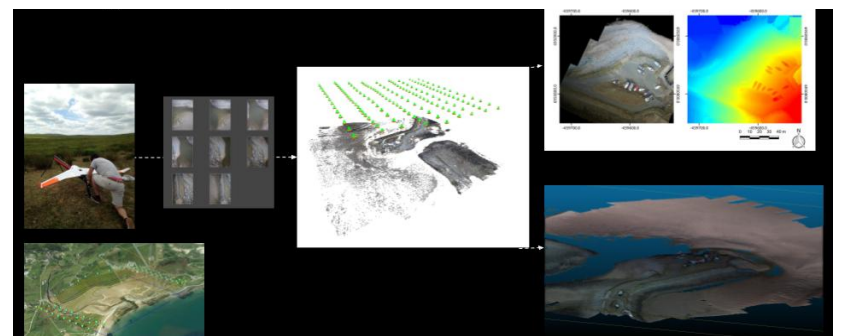
- Expertise in the analysis and use of a diverse range of remotely sensed data including airborne/spaceborne radar, multispectral, hyperspectral and Light Detection and Ranging (LiDAR) sensors

## QINETIQ/AU collaboration

AU/QinetiQ will work with potential end-users and small/medium enterprise (SME) supply-chain providers to undertake a number of experimental case studies that:

- Identify the specific business/organisation-enhancing information requirements that could be delivered through application of remote sensing
- Develop a concept-of-operation for UAS data capture, processing and end user products
- Develop an Operational Safety Case (OSC) for the SUAS-based surveying and data capture for EVLOS and BVLOS
- Identify a mutually beneficial business case that would allow all parties to grow and exploit the capability beyond the end of the GEOM project

## Data Processing chain



- Open source generated data products (Proprietary SfM also available)
- Source code & QGIS Plugins to be made available to partners to aid in data exploitation

## Surveys in progress/planned

- CHERISH Wales (RHCAMS)
- National trust
- Nat. Resources Wales
- Horizon Nuclear
- Welsh highways
- Forestry companies (various)
- Snowdonia National Park
- Welsh water