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Monitoring land change with a Keyne Eye

Skye Boag looks at how Very High Resolution satellite data is playing a key role in local authority building control

Milton Keynes is one of the fastest growing cities in the UK and a great economic success story. However, the challenge of supporting sustainable growth without exceeding the capacity of the infrastructure, plus meeting key carbon reduction targets, is a major one.

In 2013, Milton Keynes Council collaborated with European Space Imaging partner Satellite Applications Catapult, to investigate whether a more effective method could be found to detect changes to land over time, the aim being to ensure that planning management policies are adhered to. The result is an innovative smart city planning application tool known as Keyne Eye, due for completion later this year (2017).

Prior to Keyne Eye, planning management at Milton Keynes was largely of a manual nature. The process involved the checking and consideration of planning applications from developers wishing to undertake building projects, the details and constraints for each being documented in a database. If approved, planning officers were sent to physically inspect the development sites and verify that land changes were in accordance with the terms laid out in the building permits.

Inefficient and costly

The entire process was inefficient and costly to the Council. Perceiving an opportunity to make better use of satellite data to monitor the progress of approved building work, Milton Keynes approached the Catapult to provide independent the expert advice and support that was needed to harness Earth Observation data as a valuable information source.

By utilising the VHR (Very High Resolution) imagery provided by European Space Imaging WorldView-2 and WorldView-3 satellites, the Catapult was able to develop Keyne Eye, a unique Urban Planning application with which the Council can intuitively track land changes and easily identify any contravention of the planning conditions.

The Keyne Eye application feeds directly into the Council dashboard and combines eight-band 30 cm multispectral satellite imagery that is captured by European Space Imaging on a quarterly basis. The tool incorporates detection layers that immediately identify any changes that have occurred. These changes can then be analysed in accordance with the approved planning permits.

The result is substantial time and cost savings to the Council.

Planning officers no longer need to physically inspect a property to verify adherence to planning conditions; they can simply view an image on the screen. The tool allows a high degree of accuracy and, additionally, facilitates measurements of area and distance. For this reason, the 30 cm VHR imagery was crucial to the success of the project.

Multi-faceted design

As well as its application as an urban planning tool, Keyne Eye – as part of the MK Smart Project – has a multi-faceted design that addresses a number of other challenges facing Britain’s towns and cities. For example, it can be incorporated into applications such as transport and energy, healthcare, community engagement and water management.

In addition to satellite imagery, the Keyne Eye data hub can integrate information from many and varied sources such as infrastructure networks, weather and pollution-related sensor readings, and even crowdsourced data from social media and mobile applications.

The unique versatility of the tool further demonstrates the value of VHR data and the key role it can play in predicting - and averting - potential causes for concern.

THE CHALLENGE

The challenge of the project was to prove that satellite imagery was more effective and economical in change detection than the methods then in use.

THE SOLUTION

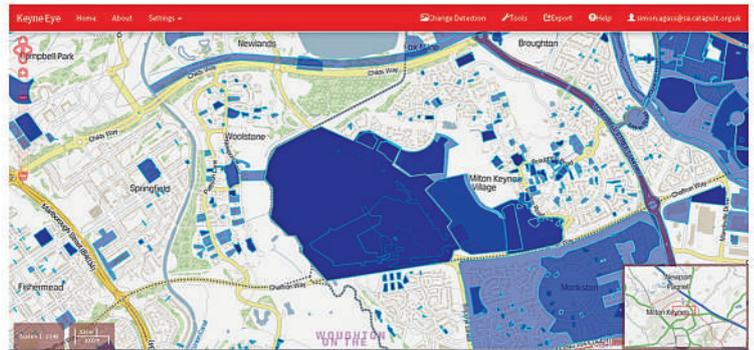
Eight-band 30cm VHR multispectral satellite imagery proved itself as both an efficient and economical means of detecting land changes over time.

THE OUTCOME

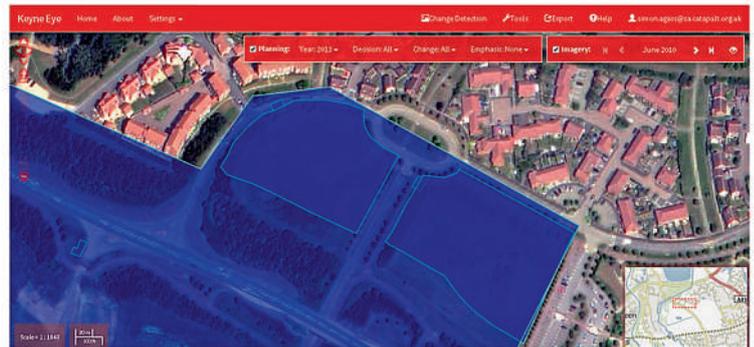
The creation of Keyne Eye ... an intuitive tool that incorporates satellite imagery with detection layers to quickly and easily identify any land changes

“Looking at the changes in an open environment can be complex with areas of 10 m x 10 m or even smaller needing to be verified. To do this effectively, you need Very High Resolution data. Thanks to its WorldView-2 and WorldView-3 data, European Space Imaging made this possible. We were able to easily and effectively monitor and detect changes, and this was crucial to the success of the project.” -- Daniel Wicks, Senior Earth Observation Specialist & Cities Lead, Satellite Applications Catapult

Skye Boag is Marketing and Communications Executive with European Space Imaging (www.euspaceimaging.com)



Planning application data overlaid on Ordnance Survey base map



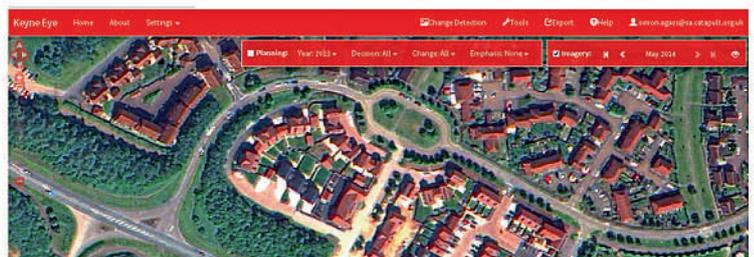
View satellite imagery over area of interest



Display change detection layer



Compare satellite imagery from different years (above) and validation of change detection (below)



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