SME Case Study

Rezatec

Monitoring and detecting
environmental change

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rezatec analyzing earth data

Rezatec provides 'landscape intelligence' for organisations with, or affected by, land-based assets.

Datasets comprising remote sensing and observational data can be interrogated via a customised online portal.

The Company

Company Name	Rezatec
Chief Executive Officer	Patrick Newton
No. of employees	12
Launched	February 2012
Location	Harwell, Oxford
Sector	Earth observation data products

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Overview

Rezatec is a specialist in providing 'landscape intelligence' for organisations with, or affected by, land-based assets such as agriculture, forestry, water and energy. The company combines Earth observation data with synthetic aperture radar (SAR) data and other remote sensing and observational data, and then applies scientific modelling and statistical analysis to create datasets that can be interrogated via a customised online portal.

* Clients and project partners include British Sugar, Bristol Water, Scottish Water, Ecover and power generator Drax.

* Awarded grants from Innovate UK and the European Space Agency.

* Affiliate partner in Climate-KIC community, one of three Knowledge and Innovation Communities created by the European Institute of Innovation and Technology, having won an incubation award in February 2013 and participated in its acceleration programme during 2014.

Generating Landscape Intelligence from Satellite Data

Earth observation (EO) satellite data has been available for many years. Improvements in the quality of data, along with innovations in combining this with other remote sensing and observational data and synthetic aperture radar (SAR) data, have allowed Harwell-based Rezatec to offer valuable tools to a new, previously untapped client base. Rezatec describes its platform as 'landscape intelligence', which offers insight and decision-making support to any organisation with land and land-based assets.

Image: ©Rezatec

Agriculture and water management

Rezatec started its business developing modelling for the carbon stock market by using satellite data to identify leaf coverage and combining this with data such as slope, elevation and soil type to estimate how much carbon was in any section of forest. It initially focused on carbon stock monitoring in response to climate change, so it was a logical extension of its capabilities to look at other assets where companies needed support in managing environmental and climate change. Since then it has adapted its platform to other activities associated with land management, such as agriculture, forestry and renewable energy.

CATAPULT
Satellite Applications

Solutions are essentially interactive geospatial maps with embedded analytics, tailored to each project.

After launching in 2012, Rezatec's business grew rapidly aided by grants from the European Space Agency (ESA) and Innovate UK, and support from the Satellite Applications Catapult. In 2012, the company received an Innovation Voucher from Innovate UK to help bolster its technical skills. The following year, it received a £250k grant for a project led by DMCii to work on measurement of land carbon stocks and fluxes from Innovate UK funding, and two further grants within Innovate UK's environmental pool. The first of these was for a project working with renewable energy provider Drax, which produces electricity from woody biomass. Led by E4Tech, the aim was to develop a methodology using EO data to accurately identify the carbon impact over time of biomass removal from forests.

In the second study, Rezatec was lead partner in a project working with British Sugar to explore ways of optimising yields of sugar beet. Rezatec was able to use EO satellite and other remote sensing data, such as information from unmanned aerial vehicles (UAVs), to measure the beet through its growth cycle and model this to see on a field by field basis how crops were doing. In future, this could provide farmers with support to manage their crop and improve their yield by, for example, identifying the need for additional irrigation or pest control, and allow British Sugar to refine management of its processing units by predicting when each field of beet would be ready to harvest.

In each case, Rezatec's solutions are provided in the form of a dashboard-style portal, tailored to each project and each type of user. They are essentially interactive geospatial maps with a lot of embedded analytics.

Rezatec's ESA grant was for a project looking at peatlands. There is more carbon sequestered in peat than in trees and it's also a massive water store. However, a lot of it is heavily degraded and does not function as a healthy ecosystem. The Rezatec project was to map, measure and monitor peatlands using satellite data and help to inform restoration activities. This feasibility study has now progressed to a separately funded two-year demonstration project.

The projects funded by the ESA and Innovate UK grants contributed towards the company's current focus on areas such as water and agriculture. It started to work with water companies on peat projects and then moved on to providing agricultural land analysis to other water companies, and agriculture became a focus following the British Sugar beet project.

Supporting peatland restoration

Future Plans

Rezatec plans to continue developing its landscape intelligence platform but retain a focus on agriculture and water.

Rezatec plans to continue developing its landscape intelligence platform, including the portal, but will retain a focus on agriculture and water. "Food and water scarcity are going to be two of the biggest challenges that face mankind," observes Philip Briscoe, Marketing Director. "But addressing water issues doesn't just mean providing tools for water utility companies – it's about water generally as so many businesses are affected by variations in rainfall, flooding or drought, water quality and so on. And the same goes for food."

Crop yields can be forecast and optimised

Opportunities lie in widening the market for its existing platform as well as developing new solutions such as flood risk and drought mitigation tools, environment management tools and pest management tools for agriculture and forestry.

"Farmers are an obvious market but food and drink manufacturers and retailers also have

requirements for information about crops and yields which may affect their buying decisions," Philip suggests. "There may also be applications within local authorities, insurance companies, brokers and elsewhere."

Rezatec has already used its skills to spread its client base globally. It was the lead partner in a consortium mapping resources and land use on Mallorca for Ecover's Glocal project in 2014, is working on a project in Indonesia looking at bio-concessions and landscape management, and has also worked in both South and North America. In future, Rezatec is keen to expand this client base. "We have global aspirations. None of our products are wedded to the UK – they can all be global."

Case Study:
Water Catchment Management

Water companies face a number of challenges, including making sure that the water they supply is fit to drink. And that is dependent on many factors, such as erosion and how the land is used in the water catchment area. Water can be polluted to varying extents by fertilisers and pesticides used on crops and also by run-off associated with grazing animals, with the nature and extent of the pollution affecting the type and cost of water treatment.
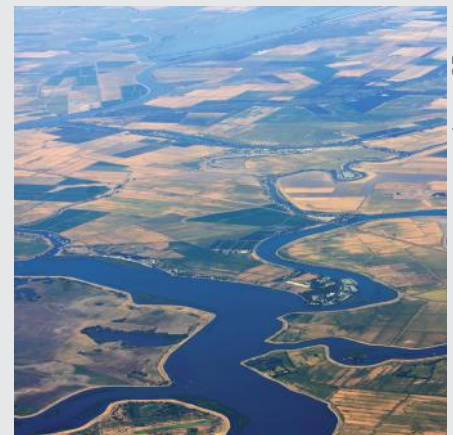

Image: ©Rezatec

Making water fit to drink

To help it understand and address this impact, Bristol Water asked Rezatec to customise its landscape intelligence platform to identify how land use surrounding two of its reservoirs had changed over the previous 40 years, and then monitor it on an ongoing basis identifying the subsequent impact on water quality. This historic aspect is possible thanks to Earth observation data from Landsat, with more recent EO and SAR data available from the likes of ESA's Sentinel satellites.

"We can use different datasets to analyse how land use has changed, looking at field boundaries, drainage basins, natural channels and so on, and from that work out hydrological sub-units which show where the water will flow," explains Philip. "This then lets you manage risk by identifying any high risk areas and provides a tool to use when communicating with landowners and farmers."

Catapult Support

Rezatec is based alongside the Catapult in Harwell. "We have massively benefitted from being in the same building," notes Philip. "The opportunities afforded by the Catapult in terms of raising our profile in front of prominent people within the industry and government have been invaluable. They have invited us to events and allowed us to showcase ourselves, which has been brilliant."

Philip adds: "We also use the CEMS [Climate, Environment and Monitoring from Space] infrastructure, which is run by the Catapult. The nature of Earth observation is that you have a lot of data and files, and need a lot of storage space. We don't have that kind of capacity internally but we needed some way of storing, processing and delivering our products, so we chose to use the virtual machines within CEMS. It's been really useful to have it onsite here. It also helps that the Catapult team are subject matter experts, and that the whole environment has been configured to support Space data."

"We have a really good relationship with the Catapult on lots of levels. They help us promote ourselves in the market and we want to collaborate with them as much as possible."

"The opportunities afforded by the Catapult in terms of raising our profile have been invaluable."

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