

Remote Sensing: Exploring the opportunities for your organisation



ADAS offers expertise in remote sensing and data analysis to solve issues for organisations or individuals seeking to assess the effectiveness of management practices and improve monitoring, assist the adaptive development of agricultural practices, or to detect patterns and improve decision-making by making use of repetitive, consistent information on land status over a range of spatial scales.

Key drivers for organisations to use Remote Sensing

- ✓ Identification of land management practices
- ✓ Near-real time monitoring
- ✓ Systematic data collection at a range of scales
- ✓ Automation of monitoring efforts
- ✓ Improve cost-effectiveness



What is Remote Sensing?

Remote sensing is the acquisition of information on a phenomenon or object of interest from a distance. This commonly involves a sensor, mounted on a satellite, aircraft or Unmanned Aerial Vehicle (UAV), that measures electromagnetic radiation emitted or reflected by the target.

The type of information that can be gathered depends on the properties of the sensor platform, including its flight path or orbit, whether it uses active or passive sensing, and the portion of the electromagnetic spectrum the sensor is designed to measure. These properties all influence the spatial, spectral, and temporal detail available from remote sensing data.

What can Remote Sensing be used for?

In order to gather information from remotely sensed data, a range of techniques may be used, from expert interpretation of imagery, up to machine learning pattern detection. By analysing the response from the target, from one or more sensors, and its change over time, remote sensing enables the collection of information over large areas at relatively low cost when compared to measuring directly.

Remote sensing can be used to monitor land use and management practices, map wetlands, and chart wildlife habitats. Data can be used to minimize damage to the environment and help decide how to best protect natural resources. Other uses include the study of archaeological sites, urban and environmental planning, and in agriculture for precision farming, yield prediction, irrigation, weed detection.

Benefits of working with ADAS

Identify opportunities | ADAS's experience and expertise helps clients use remote sensing to solve issues and achieve their goals; improving their current efforts, or understanding them better.

Expertise | ADAS has the capability to acquire and analyse remote sensing data from a range of sources, including Satellite and UAV data.

Be Supported | ADAS's experience in land & catchment management, agricultural practices, and geospatial analysis mean we can provide start to finish advice and interpretation of remote sensing data.

“ADAS have helped clients use Remote Sensing technologies to collect information over large areas, develop better understanding of current practices and improve cost effectiveness.”



Identifying opportunities for applying remote sensing

- ✓ Knowledge of a range of remote sensing platforms and applications
- ✓ Understanding of trial design to best analyse and interpret remotely sensed data with ground-truthed measurements
- ✓ Survey and assess larger areas of land over a period of time

There has been an increase in the use of UAV's to image the land surface. ADAS has carried out a number of projects which have involved comparing ground measurements with Vegetation Indices calculated from spectral imagery.



Implementing remote sensing projects

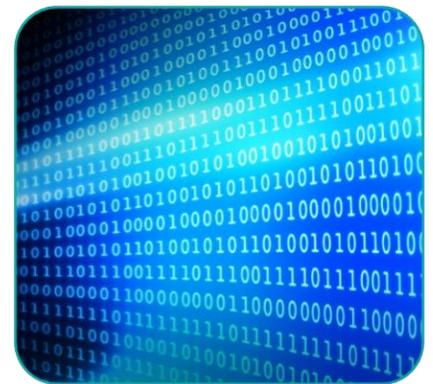
- ✓ Improved river catchment monitoring in Scotland
- ✓ Increased cost-effectiveness by providing decision support
- ✓ Developed Semi-automated approach to detection of poaching and buffer strip positioning

In collaboration with the University of Glasgow, ADAS supported a project to establish the best use of remote sensing to reduce the impacts of rural diffuse pollution on the water environment. The project was able to establish a semi-automated approach to detecting livestock poaching and buffer strips using remote sensing data.

Collaborative collection and interpretation of data

- ✓ Working with experts across different disciplines within ADAS, including crop physiology, arboriculture, crop pathology and land management
- ✓ Use of stakeholders' remote sensing platforms

ADAS have worked with stakeholders to collect and interpret data from multiple sources. Many projects involve the co-ordination of UAV flights with ground truth data capture which enables the cost-effective detection of land surface properties as well as mapping & classification of large areas.



Using freely available data to assess land properties

- ✓ The Landsat satellite record stretches from 1972 to the present
- ✓ Sentinel satellites provide high spatial and temporal resolution data since 2014
- ✓ Combining freely available data with expert knowledge and interpretation

The long time series of freely available satellite data from Landsat has recently been complemented by the Sentinel satellites which offer high spatial resolution data and images the land surface as often as every 5 days. This extraordinary amount of freely available data provides an unprecedented opportunity to observe .