Introduction to Satellite Imagery

from space information to policy delivery

Satellite imagery provide an effective means of observing and quantifying the complexities of the surface of the earth. It allows you to see the world in a different way and is a huge information source at your finger tips as you look to increase your knowledge about our environment.

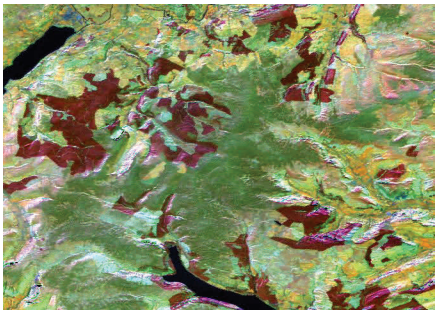
The technologies behind the application of this imagery are mature, yet evolving rapidly. They demonstrate excellent value for money as scientific tools in support of policy development and monitoring.

What does satellite imagery give you?

- Information on land cover, land use, habitats, landscape and infrastructure
- A time series by acquiring images on multiple dates
- Capability to map and monitor change

Why use satellite imagery?

- It gives you quantifiable information that is transparent and auditable
- Provides a good value for money method of mapping a wide range of our built and natural environment
- Underpins the development of baselines and monitoring in support of policy
- Fits well into existing GIS-based processing chain
- Preparation and analysis of satellite imagery is based on mature well defined processes
- Future opportunities with the development of new sensors and research techniques will ensure the growth of satellite-based applications



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How does satellite imagery work?

Satellite imagery has two main elements

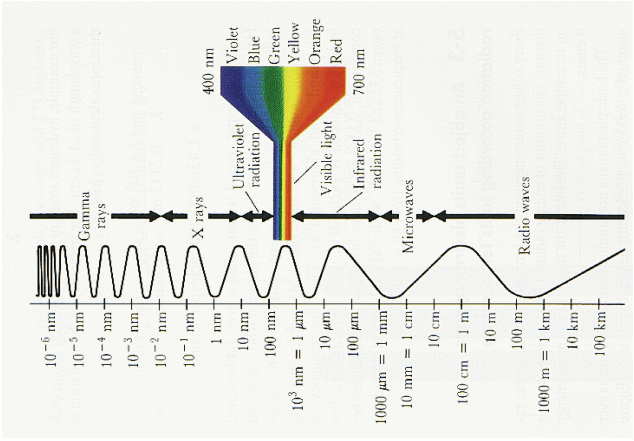
- Spatial information, described by the pixel size of the imagery and,
- Spectral information

Spectral information

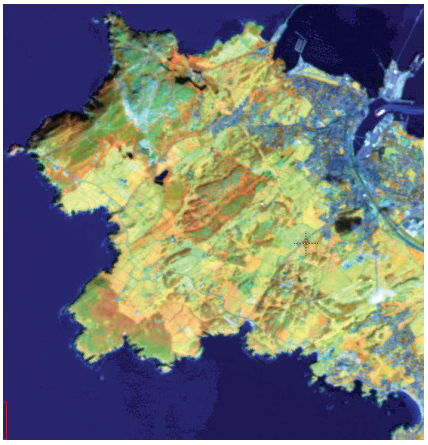
We can only see a small proportion of the electromagnetic spectrum. Satellite sensors pick up information in a much wider range allowing us to look at the infrared, thermal and microwave signatures being returned from the earth's surface.

Looking at information from these bands allows us to pick up patterns and relationships we would previously not have seen. This is the real power of remote sensing imagery.

The spectral and spatial resolution required from imagery depends on application you have. Strategic country level analysis can use a course spatial scale and a wide spectral scale, e.g. Landsat data. Regional or county studies will probably need the finer spatial resolution of, e.g. the SPOT5 satellite.



Landsat ETM+ : 25m spatial resolution
8 spectral bands
Spectral range: 400-2100 nm



SPOT 5: 10m spatial resolution
4 spectral bands
Spectral bands: 500-1750 nm

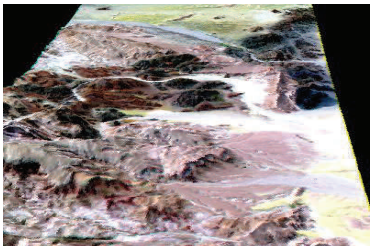
These images have been coloured up using the Near Infra Red (NIR), Infra Red (IR) and Red bands (R). These bands are particularly useful for picking up vegetation patterns based on the different forms of plants, water content and structure of the vegetation communities. Using these features it is possible to record types of land cover and also features such as productivity of vegetation communities. This can be useful when planning management activities.

Introduction to Satellite Imagery training course

If you are interested in finding out more about how you could use satellite images to help you in your work, Environment systems runs an introductory day-long training course, incorporating class and practical components. The emphasis is on understanding the fundamentals of satellite imagery to the extent that participants will be able to recognise the significant advantages of such data as well as their limitations.

Environment Systems provides bespoke training to meet the requirements of its clients, with carefully tailored case studies. Introduction to Satellite Imagery is structured to include the following components:

- What are images? What information do they record and why are they useful.
- What is resolution? Weighing up the pros and cons of spectral and spatial resolution.
- Time series: the benefits of acquiring images on multiple dates.
- Where can you get hold of images?



Environment Systems also provides intermediate and advanced courses on the application of satellite and airborne imagery.

For other examples of our work or to discuss the training courses please contact: Steve Keyworth, Environment Systems email: steve.keyworth@envsys.co.uk