**Topic 5e - Practical Guide: Accessing Data (part 1)**

So there are lots of ways to access optical satellite data these days. Some of the newer satellite programmes like ESA's Sentinel Missions make the data available almost immediately they've been collected through their data portal. So you can go online, you can download the data, and there are free toolboxes available for manipulating and processing the data. So here we can see a Sentinel-2 image of central London taken in December 2015. This is a rare cloud-free image.

And we can zoom in here and we can pan around and we can see it's amazing detail. Here we have Hyde Park and Regent's Park and the dome here in the docks and the Olympic stadium that's now being repurposed as a football stadium. And we can see the incredible detail as we zoom in.

And as I say, these data are freely available. We can download them for anywhere in the globe. But I can change the combination of bands that I want to display from this is the real colour bands, this is red, green, and blue, as we're sort of familiar from seeing from a photograph. But I can also change those to any combination of the various 12 bands that I have here as part of my Sentinel-2 image.

So now I have what we'd like to call a standard false colour composite image where I'm displaying the near-infrared band as the red colour here. And what this does is highlights areas of dense vegetation, because dense vegetation typically reflects near-infrared radiation much more than it reflects the visible. In the visible part of the spectrum, the vegetation absorbs solar radiation, and that just drives photosynthesis. But as we move to slightly longer wavelengths to the near-infrared, it reflects very strongly. And this is where we get this very, very bright rich, red colour. The brighter the red is, the denser the vegetation is.

This kind of image illustrates the ease of use and the availability of high resolution, high precision optical image data that we have available to us now. So this Sentinel data, this Sentinel image, was captured in December. I downloaded it, it took me an hour or so to download it the other day.

I have it on my desktop computer and I have a desktop computer application that enables me to process these image data and turn it into something like a land use map or a forest classification. So I can do that all from my desk with freely available data and software. And that's really generating a revolution in our ability to monitor the earth using optical image data.

So here we can see the areas of dense vegetation highlighted very strongly, it's bright red here. You could see the grass on the oval. This is Lord's Cricket Ground up here, next to Regent's Park. Battersea Park, Hyde Park. And the large area of Wimbledon Common in Richmond Park shows you how green London really is even though it's red.