THE IMPORTANCE OF GRIDS, SPHEROIDS AND DATUMS

SEPPE CASSETTARI ARGUES THAT WE NEED TO BETTER UNDERSTAND THE IMPORTANCE OF THE GRID SYSTEMS WE USE AS THE BASIS FOR DATASETS AND THEIR LIKELY IMPACT ON ACCURACY AND CONSISTENCY WHEN USED IN A WIDER CONTEXT.

I was intrigued by a recent news item on the BBC which reported a criticism of the what3words approach to finding a unique location on the earth's surface. The concerns were raised by the UK's search and rescue community, a part of our emergency services, who have embraced the idea as an effective alternative to grid references. The thinking is that using a sequence of three words is a simpler way to report your location than trying to work out your grid reference when in trouble and under pressure. Their criticism is that similar sounding words or the use of plurals can, in effect, mean the wrong location is given.

Now I happen to think that the concept of what3words is brilliant. It is innovative, creative and certainly has a role in helping individuals pin point a location, especially if they find numerical grid references difficult. But it also has its limitations. It has a fixed resolution; does not work so well if you apply it across multiple languages and different alphabets, and although it claims to be consistent, it is still subject to some level of change, albeit small.

As an alternative to having a single unique location for each address it works well where there is no national address database or the address location is poorly defined, but having at least 34 grid squares that cover the building that represents my house is not necessarily helpful.

Back to basics

I will profess to being more comfortable with numbers than words. I was taught the basics of how the Ordnance Survey GB's national grid works at school and went on to learn more about the complexities of spheroids, datums and projections during my degree and later while working for the Ministry of Defence. But I am no expert in geodesy; the intricacies of spherical trigonometry leave me cold.

But the importance of having accurate and consistent grid referencing is a fundamental of the geospatial revolution.

There has always been the competing demands of creating a global referencing system that everyone can use with the level of accuracy achieved by national grid systems, but modelled to give a best fit based on where a country sits on the globe. Different users need different systems: airlines and shipping lines, meteorological offices, global aid agencies and the military will differ in their needs compared to local authority planning departments, parcel tracking and delivery businesses, asset managers, and so on.

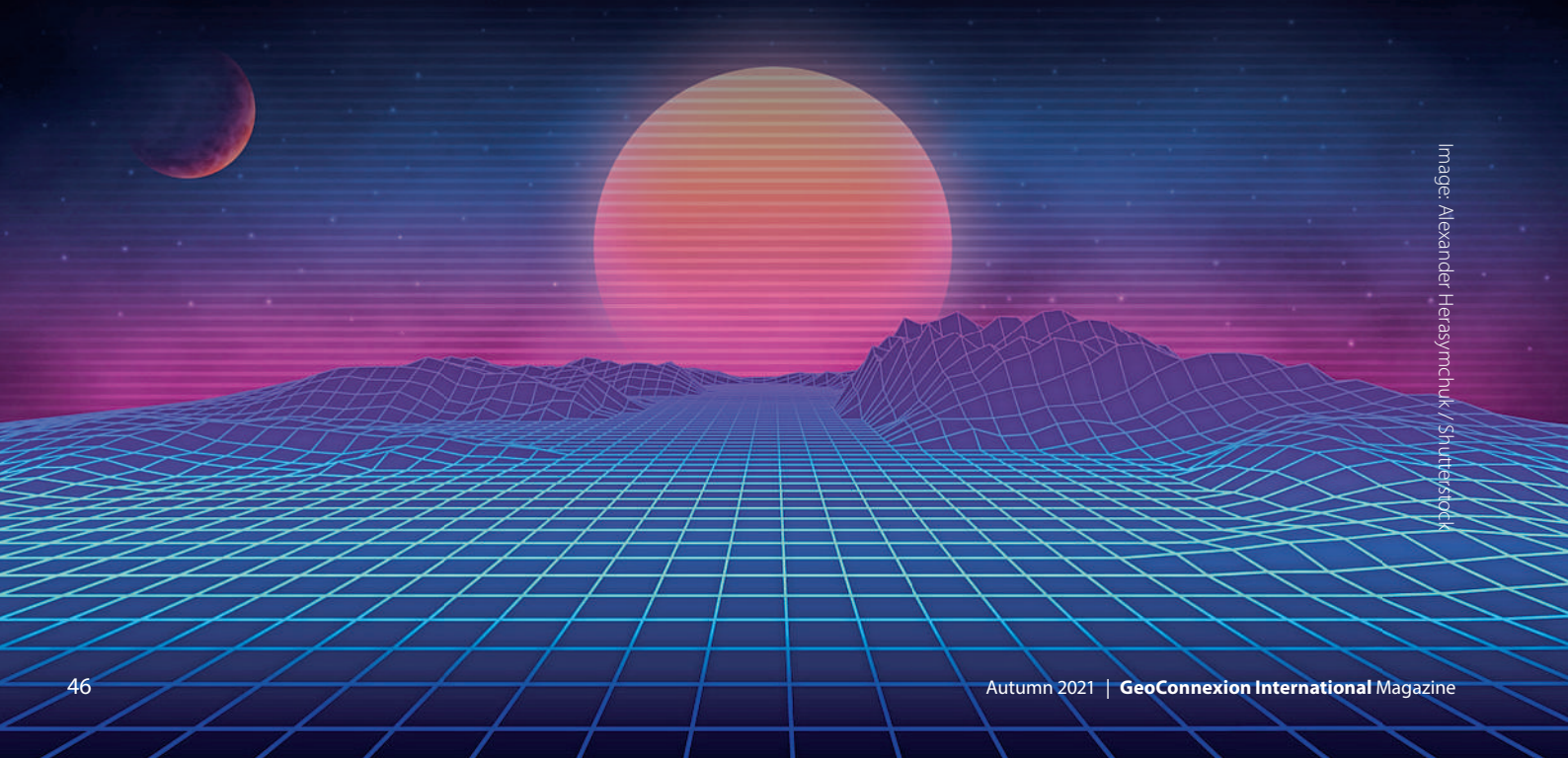
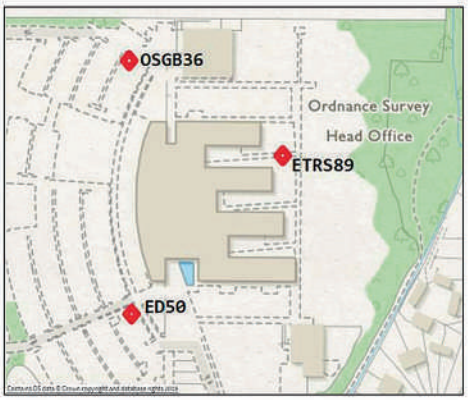


Image: Alexander Herasymchuk / Shutterstock

What's best for me?

You all know what the applications are, but do you know what is the best georeferencing system in each circumstance? And more importantly, do you have the tools to accurately translate from one system to another? Even at a UK national level we have a different grid system for Northern Ireland and the rest of the country.

There are many examples from my working life where I could quote people who have tried to link together disparate datasets that were created using different referencing systems. To be fair, this was partly due to the lack of information about the geodetics - and here we come back to the need for better metadata, the topic of a previous article.



Three points with the same latitude and longitude in three different coordinate systems. This map extract of Ordnance Survey's former headquarters building in Southampton is approximately 300m wide.

We have several ways to locate ourselves in space. We will often use an address or location name, a unique property or street reference number or administrative name in preference to a grid reference but whatever you use fundamentally it links back to the underlying mathematical grid.

Compromise

These grids are constantly under review as we adjust for the gradually shifting position of the poles or adjust our datum reference points to accommodate sea level change. New models are suggested and different projections proposed which can change the way we perceive the earth's surface. We can never square the circle of competition between equal area data and equal shape. Geospatial data is a compromise.

But we do need to better understand the importance of the grid systems we use as the basis for any one dataset and what the impact might be for its use in a wider context.

This is all about accuracy and consistency, common themes that I have touched upon before. And it is about the competing issues of the national versus the trans global.

The national grid developed and owned by the Ordnance Survey of Great Britain is the core national reference asset. It must be completely open, accessible and transparent for everyone in the mapping community to use. And we should be adding national grid refences to all our other forms of locating ourselves. They should be supplied as a standard attribute to all our address data, UPRN's and so on.

Every piece of data collected by government, commercial entities, charities, not-for-profits and individuals should have a national grid reference to a known level of resolution and accuracy.

And then everyone from an early age should be taught the basics of how our national grid reference works and why it is so important in our lives. It is as important as knowing how to handle your personal finances or monitor your health.

And just as an aside, let's make sure users of geospatial data stop confusing precision with accuracy. Just because a grid reference is recorded to six or ten decimal places does not mean it is more accurate!

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