

# SPATIAL TECHNOLOGIES



What does geospatial mean? The word geospatial is made up of two parts:

Geo – the Earth

Spatial – size, shape, and position

So geospatial refers to the size, shape, or position of something on the earth's surface.

Those in geospatial professions use tools like GPS, laser scanners, drones, and satellites to measure, map, model, and monitor features and processes on the Earth's surface.

The other term you might hear a bit about is 'GIS' or geographic information system. This is a type of database that allows us to create, store, manage, visualise, and analyse geospatial or location-based data.

## The power of spatial technologies

A GIS can help us understand patterns, relationships, and geographic context between different types of information.

Geospatial information within a GIS, helps people in lots of different professions to understand complex problems, and then make data-driven decisions. [Esri has a fantastic resource on GIS](#), and they talk about six steps within GIS that can help solve a variety of complex problems:

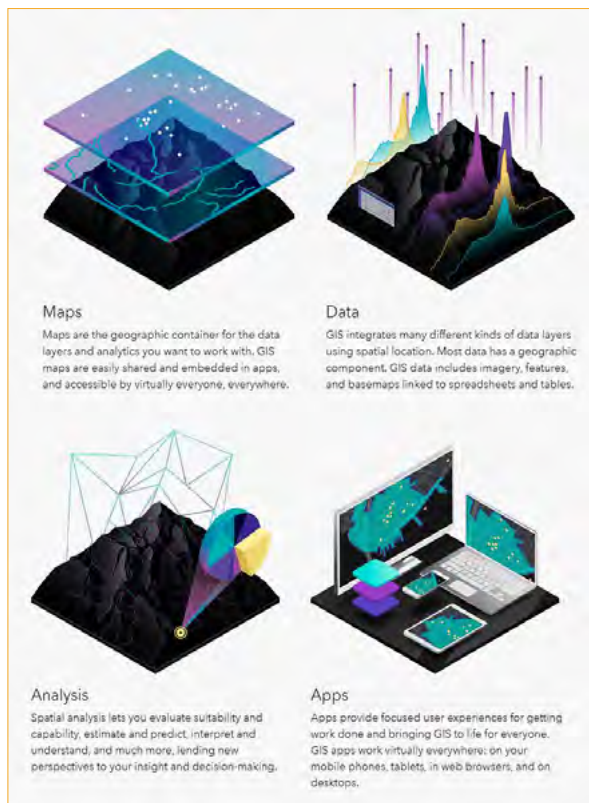
- Identify problems
- Monitor change
- Manage and respond to events
- Perform forecasting
- Set priorities
- Understand trend

## How is geospatial information used?

Just some of the industries that use it are:

- Retail
- Urban planning
- Agriculture
- Mining
- Construction
- Forestry

The following examples provide a more in-depth analysis. Here are three examples of how geospatial information is used.



What is GIS? Source: <https://www.esri.com/en-us/what-is-gis/overview>

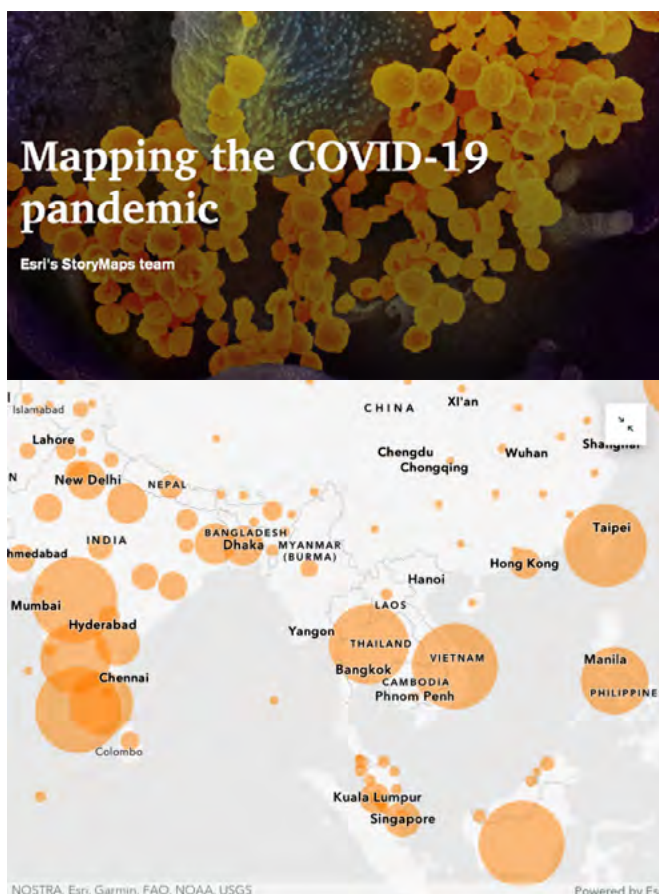
## Using geospatial data in a pandemic

Let's look at a health emergency such as the COVID pandemic.

As COVID started to emerge in China, health authorities began to collect data on the number of infections, their severity, and various other demographic information. These data were combined with location data (such as postcodes), to visualise this information on a map, inside a GIS.

As more and more data was provided, and the pandemic spread across the world, scientists were able to detect patterns or trends in geographic spread. This then formed the basis of forecasts to provide information to the community, and helped governments set priorities for management.

These decisions were underpinned by geospatial information and supported by geospatial professionals who know how to handle, analyse, and present complex information.



*This story was originally published in February 2020. While the maps in the story are automatically updated with latest available statistics, the text may include information that is no longer current.*

*View this full StoryMap on Covid 19 HERE – <https://shemaps.com/blog/what-is-geospatial/>*

## Addressing climate change with geospatial data

Another example is climate change. We have been observing the Earth for many years using satellites, aerial footage from planes and drones, and other location-based sensors. All this data has given us a very good understanding about how the climate impacts our planet and the population. We have become very good at weather forecasting, and now scientists are making predictions on how our world will change with climate change.

*View this full StoryMap on Climate Change HERE – <https://shemaps.com/blog/what-is-geospatial/>*



*[com/blog/what-is-geospatial/](https://shemaps.com/blog/what-is-geospatial/)*

## Monitoring beach erosion with geospatial data

Geographic information systems have made the management of beach erosion much easier due to the ability for scientists to view geospatial data over time. For example, take a local ecosystem like a beach. We can see this location from a satellite and look back over a number of years to see how development in the area has changed, and also how seasons and storms affect the area. We are now also able to use very high spatial resolution data from drones to view how the ecosystem is changing over time in incredibly high detail.

Open data platforms like [GeoNadir](#) also mean that these types of data can be accessed and contributed by people all over the world.



*View this full StoryMap on Mangrove Forests HERE – <https://shemaps.com/blog/what-is-geospatial/>*



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We can use many different time stamps of data within a GIS to visualise and measure change over time (temporal). We can combine this data with other climate data to see what impacts are evident in local ecosystems.

Local councils and governments are using these types of analysis methods to set priorities to manage at-risk ecosystems.

Geospatial data are also incredibly important for our built environment. With so many layers of built infrastructure, from tunnels, water, gas and electricity infrastructure, buildings, roads etc we need to know where these all are before we start to build something new.

Surveyors and GIS professionals are an essential part of the construction industry, as they can access and add to the planning information that tells us the exact location of all this infrastructure.

They also make sure that new infrastructure is built in the right location and is documented correctly so that future developments can access them when needed.

In the construction industry, geospatial data and GIS are being used to create 'digital twins' of infrastructure. Digital twins are a computer model that mirrors the built environment, so planners can better identify problems, manage, and respond to events, and make better decisions around the management of the infrastructure in the future.

There are many other professions that rely on geospatial information on a daily basis. In fact, you probably rely on geospatial information every day to do your job, or to get you from point A to point B in your daily life!

Geospatial information is everywhere!

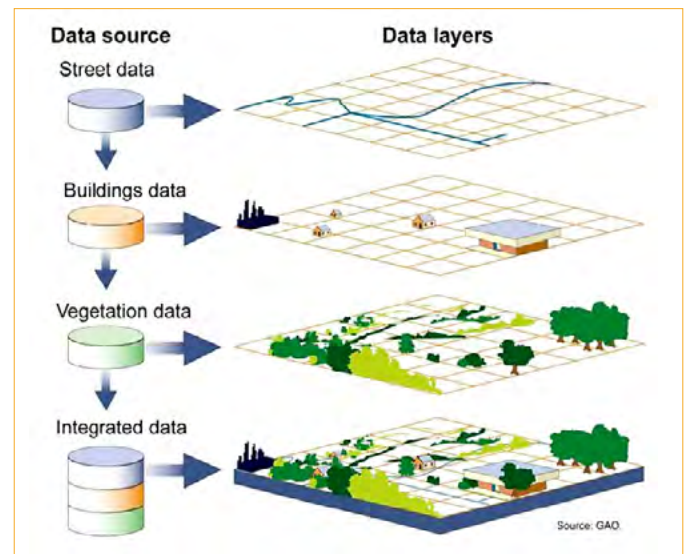
## FROM THE EDITOR: READ MORE ABOUT GIS AT NATIONAL GEOGRAPHIC

Geographic information systems (GIS) are computer-based systems used to collect, store, and display data sets related to positions on the Earth's surface.

### Time-lapse images

One important use of GIS involves creating time-lapse photography that shows processes occurring over large areas and long periods of time. In time-lapse imagery, individual frames of visual data can be captured at a slower rate and then combined and viewed at a faster rate.

Time-lapse images created with GIS help scientists understand complex natural and human-related processes



Source: <https://education.nationalgeographic.org/resource/geographic-information-system-gis>



For example, data showing the movement of fluid in ocean currents or air currents help scientists better understand how moisture and heat energy move around the globe. These convection currents of air and water regulate local weather conditions and global climate patterns as show here.

Source: <https://education.nationalgeographic.org/resource/geographic-information-systems>