Planning a geographical enquiry, but not sure where to begin? Geographical Information Systems are a great source of secondary data to help find topics and places to investigate. No matter what your starting point, GIS can help you choose a topic, generate questions, and carry out contextualising/research.

What is GIS? Geographical Information Systems (GIS) are designed to capture, store, manipulate, analyse, and manage spatial data. For example, the GIS for the Outstanding Areas database.org.uk map shows 2011 census data for each settlement. What features do you notice? What geographical questions could you ask? How could you investigate this further?

GIS gives access to maps and aerial photos at several scales and for many different topics. Start looking at maps of the area:

• What features do you notice?
• What geographical questions could you ask?
• How could you investigate this further?

GIS can help you plan both where you will collect data and how you will collect it. It is important to choose the right attribute type as it will impact on how you can present data in GIS.

**Attribute type**

<table>
<thead>
<tr>
<th>Location format</th>
<th>Feature type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location Type</td>
<td>Points</td>
<td>Locations of individual trees</td>
</tr>
<tr>
<td></td>
<td>LINES</td>
<td>Routes taken through a town</td>
</tr>
<tr>
<td></td>
<td>Polygons</td>
<td>Areas of uniform land use</td>
</tr>
<tr>
<td></td>
<td>AREAS</td>
<td>AREA of area boundaries</td>
</tr>
</tbody>
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By hand. GIS software can quickly draw a range of maps from your data, making it easy to pick the most appropriate map for your enquiry. Data and location.

Maps are a powerful technique for representing spatial relationships, but they can take a long time to draw by hand. GIS software can quickly draw a range of maps from your data, making it easy to pick the most appropriate map for your enquiry. Data and location.

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<tr>
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www.geography-fieldwork.org/gis
For technical help in using GIS and data sets to explore geographical enquiry.

**Introduction and planning**

You have an idea of a topic that your question will focus on. You have reached this point from one destination, or you are doing fieldwork locally. I know we are going here, and I want to know what to investigate. I know what to investigate, but I don’t know where to focus my question on. I know where I’m going, but don’t know the best place to do it. Don’t know the best place to do it. Don’t know the best place to do it. Don’t know the best place to do it. Don’t know the best place to do it. Don’t know the best place to do it.

**Methodology and data collection**

You have reached this point from one destination, or you are doing fieldwork locally. I know where I’m going, but I don’t have an idea of a topic that your question will focus on. You have an idea of a topic that your question will focus on.

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### What is GIS?
Geographical Information Systems (GIS) are designed to capture, store, manage, analyse, and display spatial data. As an example of a GIS for the Southeast Waterway database.org.uk, the map shows 2011 census data for a rural settlement.

- What features do you notice?
- What geographical questions could you ask?

### Secondary Geography in geographical enquiry
for technical help in using GIS and data sets to explore www.geography-fieldwork.org/gis

#### Methods and data collection

**GIS** are designed to capture, store, manipulate, geographical information (GIS) data. The map shows 2011 census data for a rural settlement. GIS software describes data formats: string, date, or number.

- **Attribute type**
  - How GIS software describes data

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**Data Observations and recordings**

- **Location type**
  - GIS each piece of data is tied to a particular location. There are three possible types of data collection. How GIS software describes data with area boundaries |

**What geographical questions could you ask?**

- You know where you’re going, but don’t know what to investigate
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**What features do you notice?**

- What do these features suggest?
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### Evaluation

- **Data**
  - Looking at maps of the area:
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Using GIS to make meaningful maps

Maps should be as easy to interpret as possible. Choose your symbols and colour carefully.

The colours you use in mapping have a big impact on how your primary data is interpreted.

• Categorical data: use colours that make sense, e.g. green for urban land-use, light grey for grass, dark green for woodland. One of the darkest shades represents the highest value. Use as above and/or below scale to highlight positive and negative scores, to focus on the highest and lowest values within a range (e.g. top 10% and bottom 10% or values above and below the mean).
• Ordinal or numerical data: for simple scales use a high to low range of green, more than one shade. The darkest shade represents the highest value. Use as above and/or below scale to highlight positive and negative scores, to focus on the highest and lowest values within a range (e.g. top 10% and bottom 10% or values above and below the mean).
• Choose your base map carefully. The colour, shade or symbol on top of a very detailed map, as this may detract from the excitement of immersing yourself in stunning locations. If you are 16 or 17 and interested in geography, you may even want to apply for an FSC Young Conservationist. You can find more about these opportunities on the Field Studies Council (www.field-studies-council.org/young-people).

Critically evaluating the accuracy, validity and reliability of your methods and conclusions is a demanding activity which can help with future career and university decisions. There are a series of courses and workshops which will help you to use logic arguments (AND, OR and NOT) across two layers.

Before using Summarise Nearby tool: Orientation of striations

After using Summarise Nearby tool: Mean striation

Which areas with the highest severity impacts if flooded are NOT highly likely to flood?

Which areas would have impacts if flooded OR are highly likely to flood?

Which areas with the highest severity impacts if flooded AND the highest severity impacts if flooded are highly likely to flood?

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When drawing conclusions, you will need to look for links between different sets of results. This means looking at primary and secondary evidence together. GIS makes this much easier; allowing you to overlay data sets into the same base map and explore relationships within and between the different layers.

Analysis tools can help you explore links between data sets and identify anomalous results.

Filter tools help you to explore patterns in your data. You may notice trends only by showing certain values e.g. show all locations where infiltration rate was more than 150 mm per hour. You may also zoom into a single variable and see where it occurs, e.g. show all locations where the environmental parameter of interest is at its highest.

Or you can show multiple attributes e.g. show all areas where the environmental parameter of interest is at its highest AND distance or travel times on flow maps, and help find the sphere of influence.

Connect origin to destination tools join multiple points to a single destination. They can also create new areas based on distances or travel times.

Connect origin to destination results

Visitor home locations by postcode

2010 sales
£3 million
£5 million

Field results (visitors to Betws-y-Coed)

Overlays

Mean house price by LSOA

> £515,982

Fieldwork results

• show all locations where infiltration rate was more than 150 mm per hour

Critically evaluating the accuracy, validity and reliability of your methods and conclusions is a demanding situation. For GIS, it is important to check that the conclusions you have made are valid and that your methods for producing the data are robust. If you have used GIS as a tool to support your research, then you will need to critically evaluate the GIS methods used and any data obtained from the GIS tool.

For students – further opportunities with FSC

Using GIS to make meaningful maps

Maps should be as easy to interpret as possible. Chose a scale and a format.

• Colour

The colours you use in mapping have a big impact on how your map is read.

• Categorical data: use colours that make sense, e.g. for urban land use, light yellow for greenhouse, dark yellow for factory. Choose a single shade for the highest value and a single shade for the lowest value.

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• Choose your base map carefully. The colour of the underlying map will affect how you interpret the overlay. Avoid located proportional symbols on a very detailed base map, as this can make the map hard to read.

For students – further opportunities with FSC

For teachers – new directions in fieldwork

GIS recognises the potential benefits that GIS can have to the study of Geography and has worked with the National Cartographic Association and ESRI UK, an international supplier of GIS software, to develop ways to integrate GIS into secondary school Geography. Technology should enhance geographical learning and not detract from the essential of immersing yourself in people's experiences. FSC's Education Technology Officer evaluates the use of technology and develops ways in which this can be incorporated into FSC's teaching in the most positive way possible.

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