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School of GeoSciences

Dissertation for the degree of

MSc in Geographical Information Science

Jessica Zenger

August 2025

Name: Jessica Zenger

Exam Number: B263983

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Part I: Research Paper

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Research Paper

Geospatial UK: Linking Scotland to a Geospatial Future

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Abstract

The geospatial industry is one of the fastest growing industries in the United Kingdom, and Scotland in particular is looking to leverage this boom in order to become a major geospatial hub within Europe. However, the majority of businesses in this sector report issues with both hiring and retaining adequate numbers of geospatial professionals to complete their work, creating a skills gap or shortage. Effort must be made to not only increase the number of youth who are choosing careers in the geospatial industry, but also to diversify the interests and careers of geospatial professionals. The best way to accomplish this is to incorporate geospatial skills, concepts, and data throughout Scottish secondary education, as well as market geospatial careers directly to students. The Geospatial UK website has been identified as a potential resource for students, teachers of all subjects, and careers counsellors to gain a deeper understanding of the role that geospatial plays in our lives, and the different pathways for entering the industry. Four market research style surveys were sent out to the following groups: students, Geography teachers, non-geography teachers, and careers counsellors. Responses to the surveys, as well as a review of relevant literature, informed the changes and alterations made to the site, including adding further academic resources and showcasing the diverse range of geospatial careers. Based on the survey results, additional outreach is recommended for non-geography teachers and careers counsellors to overcome knowledge gaps, and further updates to the site are proposed.

Geospatial UK: Linking Scotland to a Geospatial Future

Jessica Zenger

School of GeoSciences, University of Edinburgh

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1. Introduction

The geospatial industry is the UK's fifth fastest growing industry, with a predicted 10.5% annual growth that will be worth £9 billion by 2027. Scotland in particular is angling to become a major geospatial hub within Europe (Newton, 2024; Pegg, 2024). A 2024 research and analysis report produced by the UK government estimates that there are 2,600 companies in the UK for whom geospatial data is a core part of their products or services, though the report also acknowledges that this is likely a severe undercounting of geospatial companies in the UK. The geospatial industry is conservatively worth £6 billion annually to the UK economy, and is considered vital to the UK's long term goals (UK Geospatial Commission, 2024). Unfortunately, colleges and universities are not producing enough graduates with geospatial skills to meet the current demand, and many key positions in both the public and private sectors are going unfilled. Research carried out in Scotland in 2023 determined that 52% of companies were struggling to recruit staff with the right skills, 81% were unable to retain staff, and 53% felt that they would not be able to meet future staffing needs (Location Data Scotland, 2023).

This leads to two research questions that this paper hopes to answer. The first is how can increasing numbers of Scottish youth be encouraged to choose careers within the geospatial industry? The most effective way to begin to close this geospatial skills gap is to incorporate these skills, concepts, and the use of geospatial data into the classroom (Singh, Paul and Tewari, 2022), in part by having students engage with authentic, non-routine, or complex real-world problems (Hung *et al.*, 2022). As students are required to attend school in Scotland at least through age 16, this is an ideal place to introduce students to geospatial skills and concepts, as well as get them thinking about how their various skills and interests can translate into a career within the geospatial industry. The Scottish Government sees this as an area for strategic improvement, and has tasked Location Data Scotland with overseeing these efforts.

The second research question that this paper hopes to answer is how the teaching of geospatial skills and concepts in Scottish secondary schools can be extended to include subjects other than Geography. Geospatial has long been seen as the province of geography, with geospatial technologies widely available for geography education since the 1990s (Muniz, Demirci, and van der Schee, 2015), instead of as the foundation for all manner of decisions made by governments and businesses. In order to do this, a wide variety of uses for geospatial skills, concepts, and data must be highlighted, particularly for uses related to Science and Maths. Students will need to be able to see how their unique combination of skills and interests can lead them to a career within the geospatial industry.

By encouraging Scottish youth to develop an interest in geospatial science and skills, Scotland and the rest of the UK can begin to close the current skills gap. To do so, teachers must be able to teach their students geospatial skills, regardless of the subject

matter they teach; careers counselors should be able to understand the value and future of a job in the geospatial industry, and feel confident in recommending these pathways to their students.

In 2023, the Geospatial UK website was identified as a potential avenue for both increasing the number of students who are choosing careers in the geospatial industry, and how to directly market geospatial to non-Geography teachers. Geospatial UK was developed by Newcastle University as a way to introduce students and teachers to geospatial ideas, as well as to steer prospective students towards studying at Newcastle. However, Newcastle shuttered their undergraduate geospatial programs beginning the 2023-2024 academic year, and the site had not been maintained since. In 2025, Newcastle agreed to transfer ownership of the website to Location Data Scotland.

The Geospatial UK website will act as a hub for all interested parties, including students and their parents, teachers, and careers counselors, in order to help facilitate an increase in Scottish students with geospatial skills. In its initial form, this site does reach out to the various stakeholders, and does an adequate job of showcasing the importance and uses of both geospatial data and the skills needed to work in the geospatial industry; however, the site as a whole is overtly focused on surveying and geodesy, which were Newcastle's specialties. As these areas compose only a small section of the geospatial industry as a whole, the site will need to be updated to broaden the appeal of geospatial to more than just land surveying by showcasing the wide range of geospatial careers that are available.

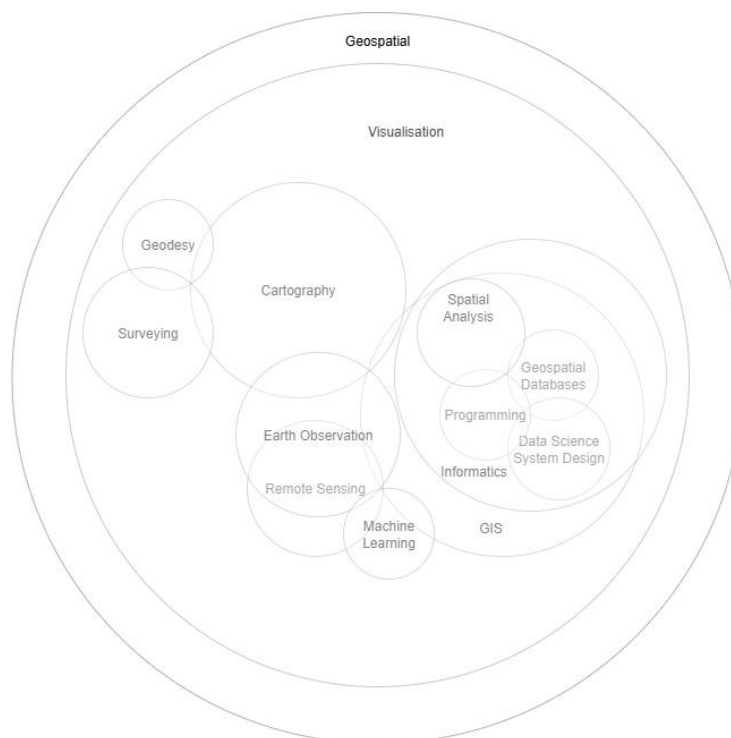


Figure 1: The geospatial ecosystem, of which surveying is only a small portion.

Additionally, the site was previously geared towards students in England and Wales; updates will be necessary in order to make clear the pathways for Scottish secondary students. In this way, Scottish students will be able to see how their skills and interests can be useful in the geospatial industry. These efforts, part of the responsible stewardship of the geospatial industry, will allow more individuals to find a meaningful career within geospatial. This will lead to the increased growth and diversification of the geospatial industry, help close the current skills gap, and make Scotland, and the United Kingdom as a whole, ready and prepared to embrace a geospatial future.

2. Literature Review

Implementing comprehensive geospatial education in Scottish secondary schools across all subjects still faces several challenges. The vast majority of research up to this point has focused on Geography and geography teachers, who are willing to teach geospatial skills in schools but reluctant to devote time and resources to them at the expense of teaching assessed work (Janes, 2023). Furthermore, as geospatial is not in the school exam system, it will not be seen as a priority (Royal Scottish Geographic Society, 2024). This is consistent with a reading of the literature, which notes multiple barriers to teaching geospatial in schools – general skills and attitudes towards GIS, teacher’s knowledge and understanding, higher education and support, and availability of educational materials and further resources (Bondarenko, 2025; Humble, 2023; Shakhislam *et al.*, 2024). One systemic review of published work noted no less than 68 barriers to implementing geospatial and GIS technologies into classroom instruction, including curriculum, time allocated, and technology under Resource barriers, and technical support, teachers, and learners under Human barriers (Bernhäuserová *et al.*, 2022). Due to these barriers, the use of geospatial concepts and skills in education is likely to be sparse and fragmented (Konstantakatos and Galani, 2023).

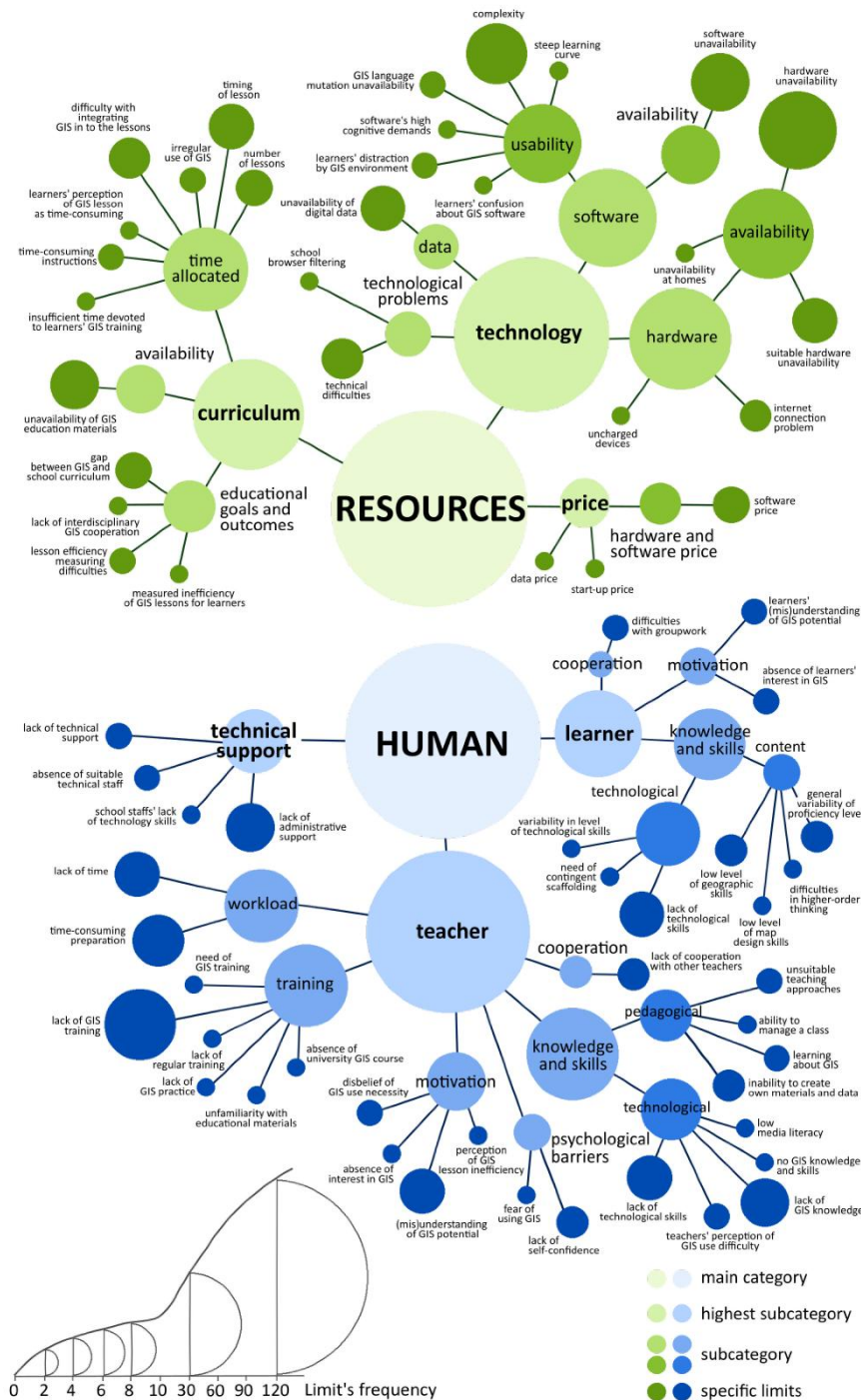


Figure 2: A diagram of the barriers to geospatial education in secondary schools. Source: Bernhäuserová et al., 2024.

Rather than teaching geospatial as a discrete subject, it would be better to use geospatial as a tool for teaching work that is assessed and in the exam system (Sinton, 2009). It is well understood that teaching geospatial skills in higher education empowers its graduates to effectively engage with spatial data (Bearman et al., 2016), and that adoption of these skills is more widespread in places with a curriculum mandating it (Kerski, Demirci, and Milson, 2013; Wang and Chen, 2013), though the

term 'spatial thinking' is hard to quantify and difficult to measure progress in (Hickman, 2023). Most GIS/geospatial skills teaching is done through geography (Lee, 2023), and considerable time and energy has been spent studying how to effectively incorporate geospatial into geography education (Abernathy, 2023; Brown et al., 2023; Curtis, 2015; Favier and van der Schee, 2014; Kim, 2024; Lee, 2023; Zwartjes, 2019).

However, it is not only geography students who would benefit from engaging with geospatial skills and data; this would be valuable for science, humanities, and even art/design students as well (Bakri, Sugiarti and Wahyudin, 2019). Geospatial should be incorporated into the regular curriculum of these subjects (Nielsen, 2012), specifically through the use of web maps and other interactive resources (de Lazaro Torres, de Miguel Gonzalez and Morales Yago, 2017; Lapon *et al.*, 2020; Sofias and Pierrakeas, 2023), or through coursework about topics that transcend subject area borders, such as human health, biodiversity, or population growth (Kerski, 2008). This should eliminate the problem in that it may not be feasible to incorporate obvious geospatial elements into the curriculum until the last few years of school, but by that point students have already chosen higher level classes and may have locked themselves out of geography. A second issue that teachers need to overcome is a need for students to see the purpose of geospatial (Healy and Walshe, 2019), which is addressed by incorporating geospatial concepts and skills into non-Geography subjects. Additional research is needed on integrating geospatial skills, concepts, and data into non-Geography subjects; this paper hopes to begin to address that research gap.

Geospatial UK can increase the effectiveness of their mission by adhering to principles of educational marketing. The main drivers of consumer engagement and loyalty are learning, satisfaction, and quality educational content (Antunes *et al.*, 2019; Budevici-Puiu, 2020), which is crucial for growth (Gregurec, Mandic and Bakic, 2024). Additionally, positive word of mouth is crucial (Kumar *et al.*, 2013), as is involving from the start the diverse communities you hope to serve (Finkelstein and Hoy, 2017). This can be either in person, or more likely in the current environment, via social media. Social media is currently the most innovative action that an organization can take in educational marketing (Riccomini *et al.*, 2021), and participation is required in order to improve visibility (del Rocio Bonilla *et al.*, 2019).

Little research into how to effectively incorporate geospatial skills and concepts into STEM subjects has been done, and none at all into art or design. A program in the state of Virginia (USA), The Geospatial Semester, has trialed adding a separate class in which students apply geospatial concepts to problems in their communities (Kolvoord, Keranen and Rittenhouse, 2019). Though the program has seen some success, and they specifically note that a teacher of any subject could lead the class, this still has the same issues in that students have to select this class in order to see the benefits.

Joyce, Meiklejohn, and Mead (2020) advocate for the use of drones in secondary education as a way to promote the use of geospatial skills and concepts, and get students interested in STEM careers; however, this would represent a significant cost investment to obtain the necessary equipment. It also comprises a significant time investment on the part of teachers to learn this technology. While there is some research to suggest that teachers are more aware of and competent with technologies than previously thought (Curtis, 2020), it is still unlikely that teachers will devote time to this when they already have a myriad of other calls on their time.

3. Methodology

This project will take place in four phases. The first phase consists of creating, editing, and sending out surveys to the four target groups – current students with an interest in geospatial skills and data, secondary Geography teachers, secondary teachers of non-geography subjects, and careers counsellors. The surveys themselves are all market research style surveys, generally focusing on knowledge of and attitudes towards the geospatial industry, and helpful features on a website about the geospatial industry. Each survey does differ slightly from the others in minor ways – both teacher surveys ask about how best to incorporate geospatial concepts into lessons, but the geography teacher survey asks about reaching out to collaborate with non-geography teachers; the careers counsellor survey asks about barriers to recommending unfamiliar industries to students; and the student survey asks current students about what sorts of resources they would have liked to have access to when they were first entering geospatial. The surveys were created through Microsoft Forms, and dispersed with the help of Location Data Scotland to the appropriate parties. More information on the creation of the surveys can be found in the following technical report.

In Phase Two, the results for each survey will be analysed for any emerging trends and patterns. Follow-up interviews will be conducted with individuals who indicated they would be willing to do so in the initial survey. These follow-up interviews will focus specifically on the Geospatial UK site in its current, pre-modification form, and will be done with a mix of teachers of various subjects as well as careers counsellors.

Participants will be asked about their thoughts on the current flow of the website, any additional resources they would want to see, and any questions or concerns they have about the website. Though some pre-scripted questions would be asked, there must also be the ability for the conversation to naturally flow, allowing for the interviewer to gain insight into the interviewee's thoughts (Thagaard, 2013) and how they perceive the world (Kvale, 2001), which in this case is the Geospatial UK site, and ultimately enhancing data quality (Jentoft and Olsen, 2019).

Phase Three is where the plans for the site changes will be drawn up. Feedback from the surveys and follow up interviews, as well as from the relevant literature, will inform the site changes. Once the initial site changes are devised, feedback will be gathered from Location Data Scotland regarding these changes, and any other changes that they deem necessary.

Phase Four is where the changes are made to the website. Changes are envisioned to be made in three stages. The first stage is for quick changes, including removing or consolidating redundancies or sections that are no longer needed, improving site navigation, and changing contact information. The second stage is for more involved changes, such as moving sections of the website between different pages, adding additional resources, and updating the highlighted geospatial careers to better showcase the diverse jobs that are available. Most of the changes are anticipated to be made during this stage. The third stage is for more involved projects, such as the AI chatbot, and updating the web map showing geospatial college and university programmes, as well as for last minute changes that are required. Though most of the changes will have been made in the second stage, this last stage is where the more technically complicated changes will be made. The following technical report goes into these changes in more detail.

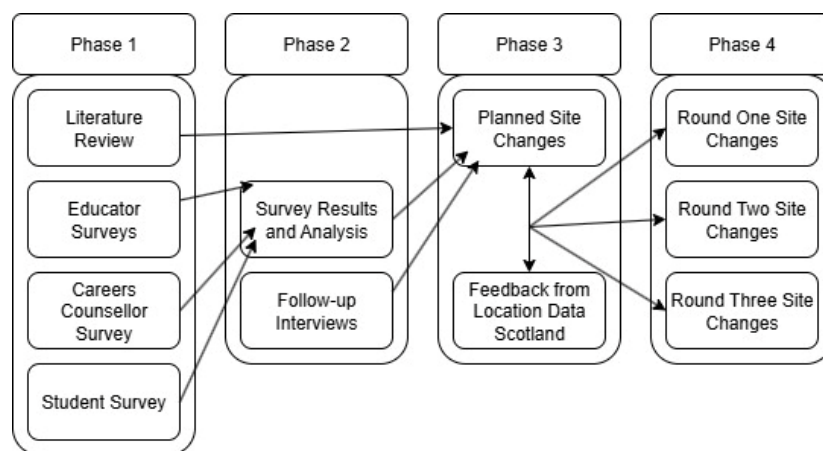


Figure 3: Data flow diagram showing the methodology for this project.

4. Results

4.1 Surveys

Four surveys were conducted between April and July 2025, for each of the following groups: current students with an interest in geospatial skills and data, secondary Geography teachers, secondary teachers of non-geography subjects, and careers counsellors. The data from each survey was analysed independently for patterns or trends to inform the changes and modifications to the Geospatial UK site.

4.1.1 Student Survey

The majority of students appear to become interested in geospatial in college, through a variety of different interests, and were most influenced by mentorships and hands-on projects. The biggest barriers to entry into geospatial were little to no networking opportunities, and not knowing how their skills could be useful for solving real-world problems. For full results, see Appendix A.

2. At what stage in your education did you first become interested in geospatial topics?

[More details](#)



Figure 4: Responses from Student survey, Question #2.

3. What initially sparked your interest in geospatial technologies? Select up to 3. If marking 'Other,' please explain.

[More details](#)

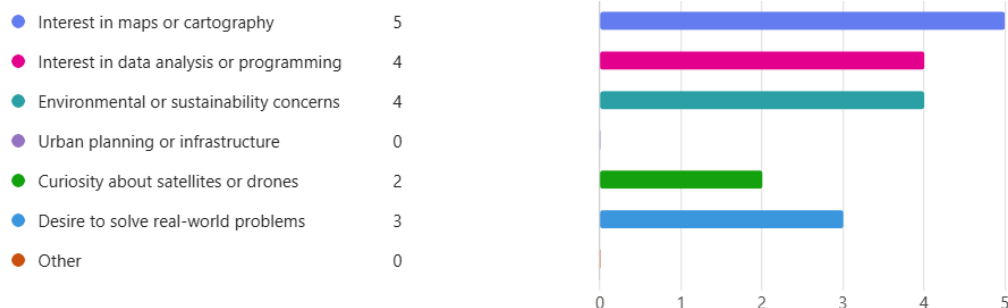


Figure 5: Responses from Student survey, Question #3.

5. On a scale of 1-5, where 1 is Not at all Important and 5 is Very Important, please rate the following in terms of the development of your interest in geospatial topics:

[More details](#)

● 1 - Not at all Important ● 2 ● 3 ● 4 ● 5 - Very Important

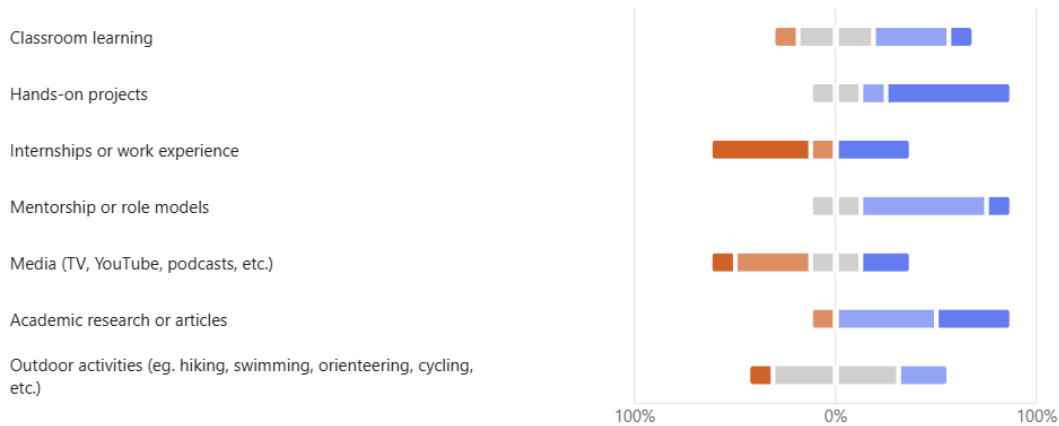


Figure 6: Responses from Student survey, Question #5.

7. On a scale of 1-5, with 1 being Very Unhelpful and 5 being Very Helpful, please rate the following in terms of information you had/would liked to have had when first learning about geospatial skills and careers:

[More details](#)

● 1 - Very Unhelpful ● 2 ● 3 ● 4 ● 5 - Very Helpful



Figure 7: Responses from Student survey, Question #7.

4.1.2 Geography Teacher Survey

The majority of geography teachers would prefer teaching resources (of which they strongly preferred real-life case studies, videos, and interactive web maps), resource user guides, and a regular newsletter about education updates. Furthermore, geography teachers are interested in climate studies and map projections, and want their students to be able to critically engage with the relationships between geography and real-world issues. For full results, see Appendix B.

3. What features would you find helpful on an educational website regarding using geospatial skills in the classroom?

[More details](#)

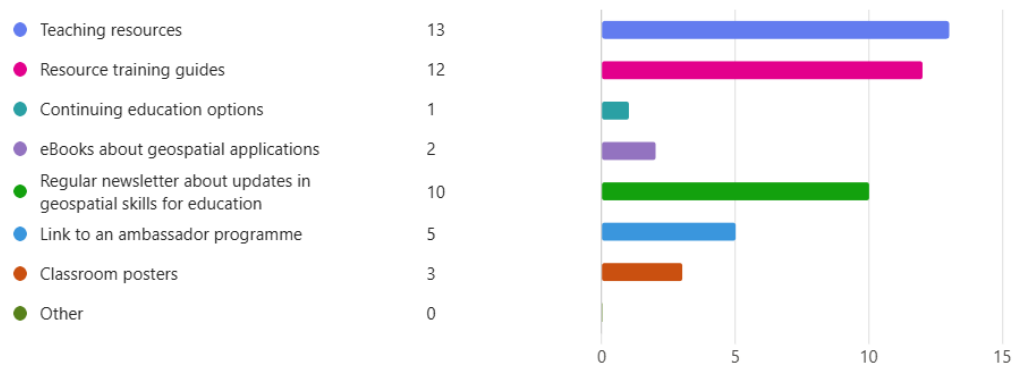


Figure 8: Responses from Geography teachers, survey Question #3.

4. What types of teaching resources would you find most helpful for incorporating geospatial skills into your classroom?
Please choose your top 5 responses.

[More details](#)

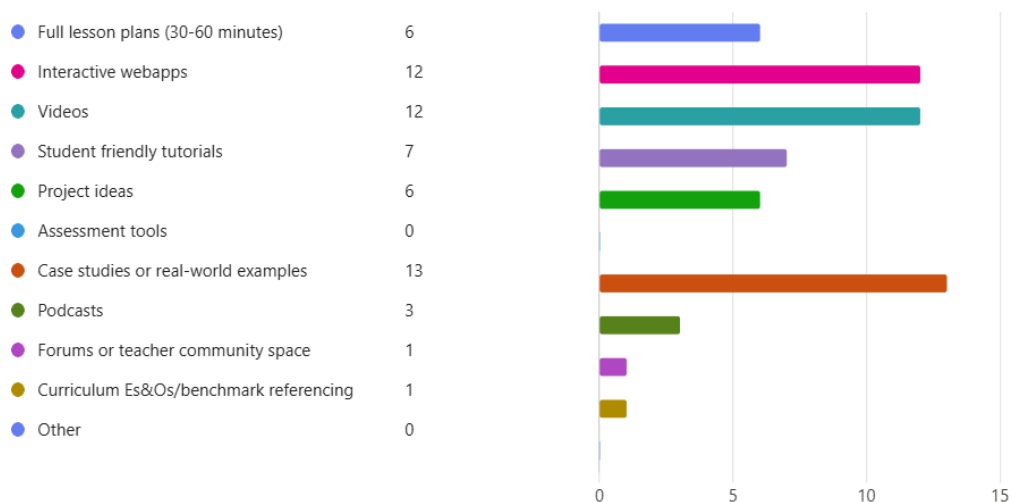


Figure 9: Responses from Geography teachers, survey Question #4.

8. Please rank the following *geospatial skills* student learning outcomes, from Most Important to Least Important.

[More details](#)

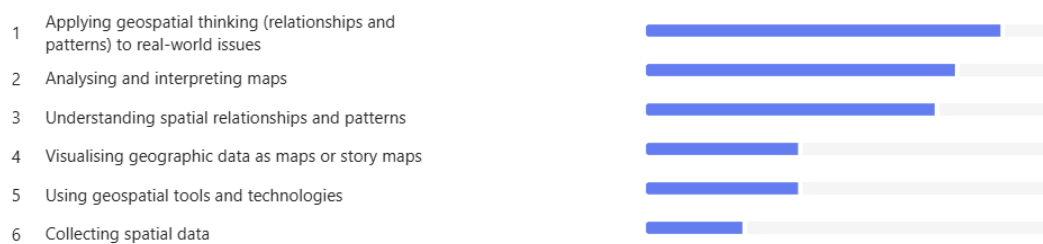


Figure 10: Responses from Geography teachers, survey Question #8.

4.1.3 Non-Geography Teacher Survey

Despite being less likely to be familiar with geospatial, non-Geography teachers were overwhelmingly positive that geospatial can add value to their classrooms. They mainly would like to see additional teaching resources, in particular case studies and videos, followed by web apps, tutorials, and project ideas. Their goals appeared to be increasing students' abilities to think critically while engaging with real-world issues. For full results, see Appendix C.

2. How well do you agree with the following statement:

Using geospatial skills (e.g. creating and interpreting maps, understanding of spatial relationships, etc.) can add value to my classroom.

[More Details](#)

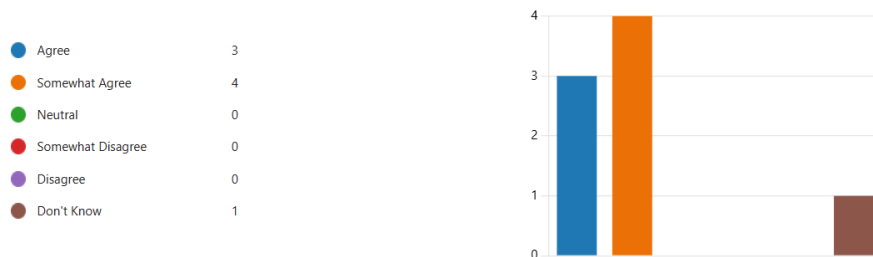


Figure 11: Responses from non-Geography teachers survey, Question #2.

4. What features would you find helpful on an educational website regarding using geospatial skills in the classroom?

[More Details](#)

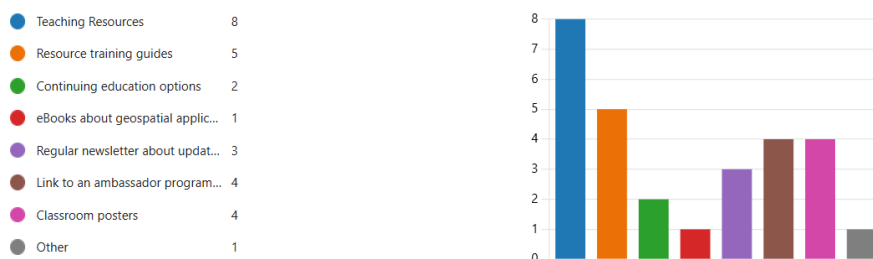


Figure 12: Responses from non-Geography teachers survey, Question #4.

5. What types of teaching resources would you find helpful for incorporating geospatial skills into your classroom? Please choose your top 5 responses.

[More Details](#)

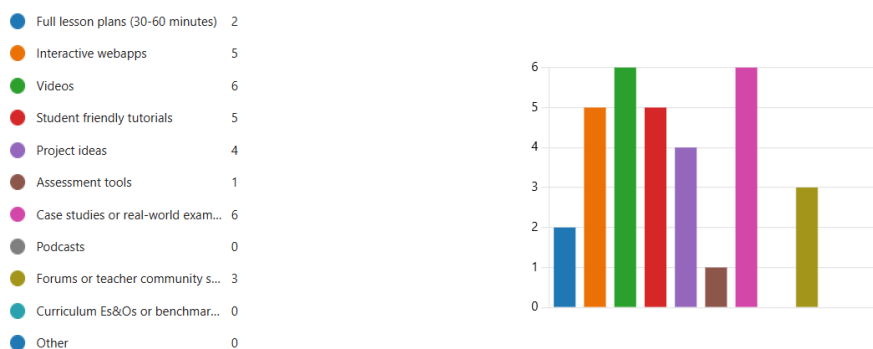


Figure 13: Responses from non-Geography teachers survey, Question #5.

4.1.4 Careers Counsellor Survey

Careers counsellors appear to have vaguely heard about geospatial, but they are unfamiliar with the types of jobs that entails, and therefore have not recommended a geospatial job to a student. Career pathways and jobs are the most important thing to have information about, and they would generally prefer to see videos or careers spotlights, a careers pathway roadmap, and some sort of interest assessment or career matching tool. For full results, see Appendix D.

2. How familiar are you with the types of *careers* that use geospatial skills and technologies? (Examples: GIS analyst, urban planner, environmental consultant, drone operator, cartographer)

[More details](#)



Figure 14: Responses from Careers Counsellor survey, Question #2.

5. Please rank these types of information in order by how helpful they would be for guiding students towards geospatial careers, from Most Helpful to Least Helpful

[More details](#)



Figure 15: Responses from Careers Counsellor survey, Question #5.

7. What types of features would make a geospatial careers website valuable for your work with students?

[More details](#)

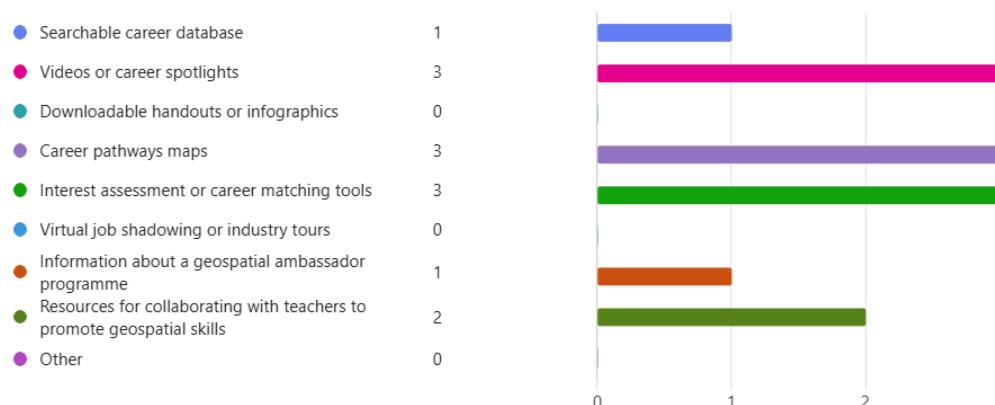


Figure 16: Responses from Careers Counsellor survey, Question #7.

4.2 Website

A number of additions and changes were made to the Geospatial UK website based upon the results from the surveys. The biggest change is that a number of additional resources were added to the Resource page. These resources are drawn not only from Geography, but explicitly includes maths, science, and coding.



Figure 17: Coding resources added to Geospatial UK.

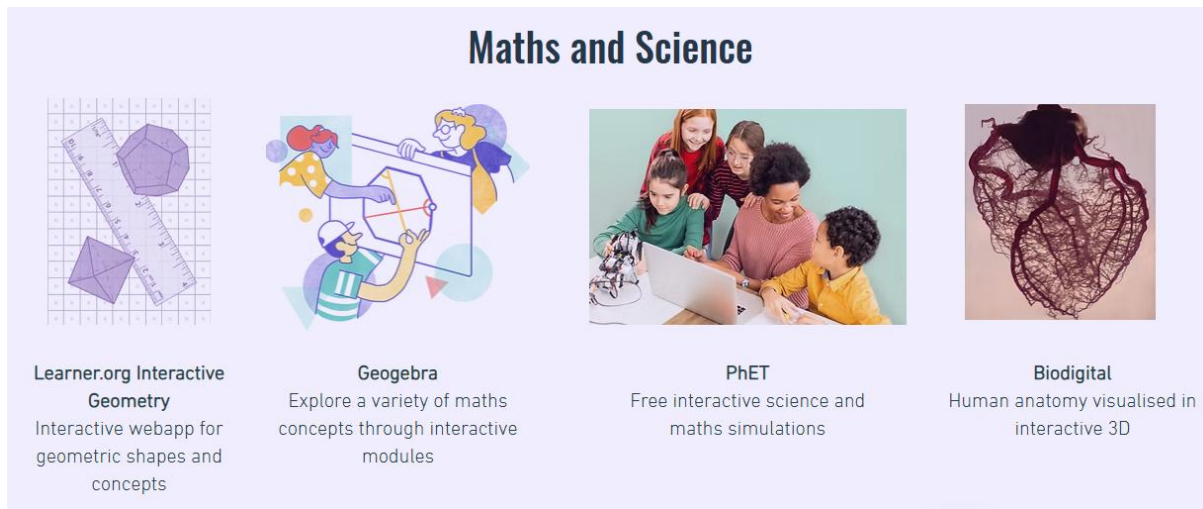


Figure 18: A selection of Maths and Science resources added to Geospatial UK.

Additionally, several of the resources newly listed allow users to explore geospatial concepts and data as it relates to history, the social sciences, business, and more.



Figure 19: Geography-based resources, which can be used for a variety of different topics.

Given that several of the non-Geography teachers who responded to the survey did not know why geospatial would be relevant to their subject matters, providing these expanded resources is crucial. This was done in an effort to help diversify the resource offerings available on the site, which previously were mostly geared around Geography, directly relating back to the research question of how to incorporate geospatial into non-Geography subjects. By showing how geospatial can align with other fields, more students will be able to see themselves in a career that involves geospatial concepts, skills, and data. Finally, resources around mapping, including both map design principles and actual mapping sites and programs, were included.

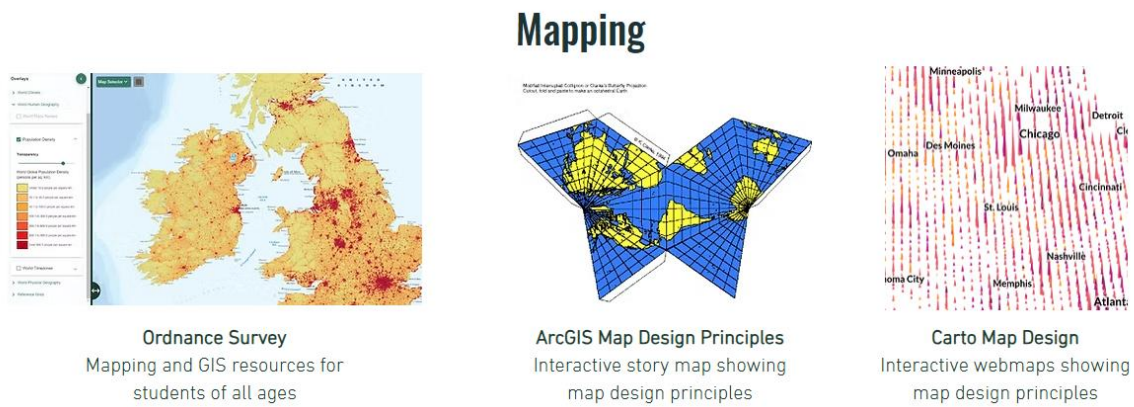


Figure 20: A selection of mapping resources on Geospatial UK.

Mapping is at the core of geospatial; Geospatial UK needs to help provide these resources in order to give students the full picture of what they can expect in the geospatial industry. Together, these resources will give more students the confidence to choose a geospatial career, ultimately closing the current skills gap; this helps to answer our first research question.

Additionally, the format of these resources directly addresses several barriers uncovered in the literature, as well as the survey results. The majority of these resources are web maps, videos, or other small resources that can be slotted into existing lesson plans, not replacements for entire lesson plans. This allows teachers to fit them into the classroom wherever they are relevant, and still prioritise assessed work. Web maps and videos are not technologically complicated, meaning that teachers are more likely to use them. Given that the use of technology in the classroom is also appealing to students (Al-Hariri and Al-Hattami, 2017; Lai, Wang and Lei, 2012; Shea and Stockford, 2015;), students should be more interested in and engaged with lessons that incorporate technology.

The second major change is the addition of a simple AI chatbot, created through the website WotNot. This chatbot can answer basic questions about the current geospatial industry and its anticipated future, what sorts of jobs have geospatial elements, how to find additional geospatial resources for teachers and students, how students can get started in geospatial, and where individuals can find job opportunities. This is in line with best practices for AI chatbots on educational websites, which help to increase efficiency and disseminate information (Taylor and Owusu, 2025), and increase usability and user satisfaction (Kuhail *et al.*, 2023; Merkouris *et al.*, 2024). This is also in line with the primary pages that users visit, according to the site analytics, which shows most visitors are looking at the Careers and Pathways pages. For full site analysis, see Appendix E.

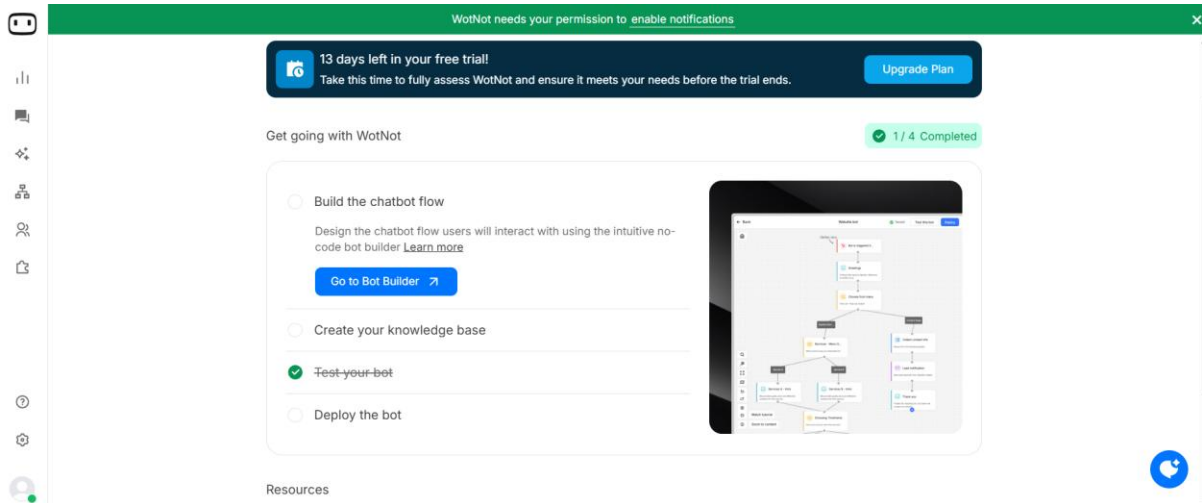


Figure 21: The WotNot main dashboard for the Geospatial UK chatbot.

Additionally, a number of smaller additions and changes were made to the site. Where possible, resources and testimonials from Scottish individuals were included. If we want more students, and Scottish students in particular, to choose careers in the geospatial industry, then they should be able to see other Scots who have made those same choices. Secondly, the Careers page, which previously featured a number of careers within surveying, has been updated to showcase a wide range of careers that rely upon geospatial concepts, skills, and data.



Figure 22: A small selection of the jobs previously highlighted at Geospatial UK. Of the 15 jobs showcased, 9 of them included the word 'surveyor' in the name.

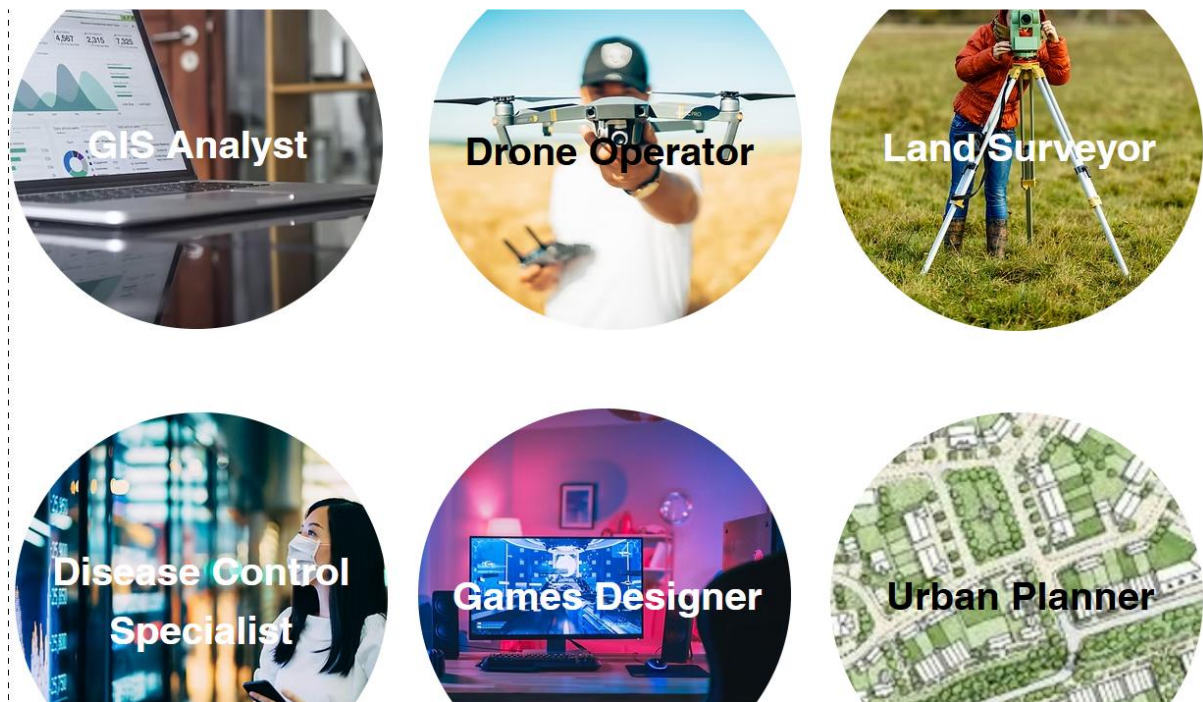


Figure 23: A selection of the updated careers highlighted on Geospatial UK.

These modifications relate directly back to our initial question of how to diversify the geospatial industry. By showing students a small portion of what is possible, they are allowed the space to consider their own skills and interests, and how they might become part of the geospatial industry. Finally, a number of smaller changes were made to improve the overall flow of the website. These changes include consolidating a definition of geospatial from both the Students and Teachers pages and placing it on the Home page; consolidating resources and videos together on appropriate pages; and updating the order in which pages appear across the top of the site. For a full list of changes and modifications, see Appendix F.

5 Discussion

5.1 Limitations

There are several limitations that impact the conclusions that can be drawn from the collected data. The biggest limitations were the sample size of the surveys and follow-up interviews. The surveys only received 32 total responses, with a breakdown as follows: eight (8) responses for the Students survey, thirteen (13) for Geography teachers, eight (8) for non-Geography teachers, and three (3) for careers counsellors. It is difficult to make adequate inferences from the data, though there are still some trends that are noticeable even with the small number of responses. Secondary to the sample size of the surveys was the number of teacher or careers counsellors survey respondents who indicated that they would be willing to complete a follow-up interview.

The purpose of the follow-up interviews were to dive deeper into the responses, as well as to gain first-hand impressions of the Geospatial UK website prior to any changes being made. Of the 24 survey respondents who were either teachers (of any subject) or careers counsellors, only two indicated that they would be interested in completing a follow-up interview; neither of those two responded to communication regarding scheduling said interviews. Changes to the website, which were originally intended to be based on a combination of the literature review, survey results, follow-up interviews were therefore made solely based on the literature review and limited survey results.

5.2 Implications

The survey results suggest several avenues for continued research or outreach. The most critical area in which further outreach is necessary is to non-geography teachers and careers counsellors. One of the goals of the Geospatial UK website is to reach out to non-geography teachers, in order to show them that geospatial concepts and skills can be included in their lessons. Most non-geography teachers indicated through the survey that understood how geospatial relates to their subject area, but there were only eight responses out of thousands of potential teachers; many teachers who do not understand how geospatial relates to their subjects may not have self-selected out of taking the survey in the first place. Though the website now addresses geospatial resources for non-geography teachers, they may not even approach the website if they do not understand how this will be useful to them. This lack of understanding about the benefits of geospatial skills and data for their subject areas could also explain the low response rate to the survey. Similarly, one-third of careers counsellors had little to no experience with or knowledge of the geospatial industry; it is unclear how likely they are to recommend such an industry to students. Therefore, additional and continued outreach to these groups is necessary in order to achieve the intended outcomes.

This can be achieved in a number of ways. Workshops or seminars, including continuing education opportunities, can be arranged specifically on how to integrate geospatial into the classroom; for more efficiency, these could be scheduled on teacher work days when students are not present. These options also present the opportunity to make industry connections, which students have listed as their biggest barrier to entry into the geospatial industry. See the table below for more detailed information regarding continued outreach to teachers and careers counsellors.

Table 1: Outreach Strategies for Teachers and Careers Counselors

Outreach Strategy	Description
Workshops and Seminars	– Interdisciplinary workshops to demonstrate the relevance of geospatial skills across various subjects – Invite industry experts to discuss real-world applications and emerging trends

Collaborative Projects	– Development of joint projects that integrate geospatial with other subjects – Showcase practical benefits
Resource Sharing	– Provide continued access to teaching resources, lesson plans, and case studies that highlight the applications of geospatial for diverse fields
Industry Connections	– Facilitate connections with local businesses and organisations that use geospatial technologies – Offer insights into career paths
Career Talks	– Arrange talks by professionals in geospatial fields to discuss potential career paths and skills needed
Newsletter and Social Media	– Create a newsletter or digital communication channel detailing updates, opportunities, and success stories – Use social media to share articles, videos, and tutorials that emphasise geospatial skills
Professional Development	– Arrange for continuing education opportunities for teachers and careers counselors – Potential for offering continuing education credits or certifications to teachers who incorporate geospatial skills into their curriculums

Though some outreach is likely to be done by geography colleagues, it would be better if such outreach was undertaken in a more formal way. Possibilities for organizations that could undertake this work would be Education Scotland, or a non-profit organisation that works in this area. Though communication could take the form of emails or teacher trainings, it would be better if outreach was centered around, or otherwise included, the opportunity for students to complete their own geospatial projects. This is in line with the 87 percent of student survey respondents who indicated that they would have benefitted from interactive or otherwise hands-on opportunities when they were first getting interested in geospatial. This is also in line with peer-reviewed research that suggests that school-industry projects offer authentic learning experiences and support the development of students' interest in STEM careers (McKenzie, Cook and Roulston, 2020; Smit *et al.*, 2021; Svärd, Schönborn and Hallström, 2024). This would also allow students to engage in projects that span multiple subject areas. See Table 2 for ideas about projects that combine geospatial and other subjects.

Table 2: Project Ideas Incorporating Geospatial Skills, Geography, and Other Subjects

Subjects	Project Ideas
History	– Map Historical Events: Create maps of significant historical events and moments, and analyse how geography influenced these events

	– Time-Travel Projects: Compare historical maps with current maps to study urban development or environmental changes
Science	– Climate Change Mapping: Use GIS to analyse climate data, weather patterns, and their impact on different regions – Biomes and Ecosystems: Study various ecosystems and map out biomes, focusing on biodiversity and conservation
Math	– Spatial Data Analysis: Integrate statistics with geospatial data to teach students about population density, demographics, or resource allocation – Coordinate Systems: Explore coordinate geometry through map-making and navigation exercises
English	– Place-based Storytelling: Write stories or essays that focus on specific locations, incorporating geographical descriptions and data – Travel Writing Projects: Create travel guides or blogs using maps and geographical research
Art	– Cartography as Art: Design creative maps or artistic interpretations of geographical concepts – Landscape Art: Study geographical features through art projects that involve painting or drawing landscapes
Physical Education	– Orienteering and Navigation: Combine outdoor activities with map reading skills and GPS navigation – Sports and Geography: Research global sports and their geographical origins and adaptations
Computer Science	– Interactive Mapping Tools: Develop apps or websites using geospatial technologies and data visualisation – Coding: Teach basic programming skills to analyse and visualise geographic data
Economics	– Resource Distribution: Map economic data such as trade routes, resource locations, or economic disparities – Urban Development: Study city planning and economic geography using spatial analysis

This would achieve those goals while actively giving students the opportunity to work hands-on in the geospatial field. Official contests or competitions, sponsored by Education Scotland or a non-profit, could offer reasonable incentives for participation, which have been shown to increase their integration into schools (Wang and Chen, 2013); further recognition could be achieved through an organisation such as GeoMob, which could give students the opportunity to discuss their work and interact further with geospatial professionals.

An additional opportunity for students to interact with geospatial skills and concepts would be an interactive game or simulation that could be incorporated into the Geospatial UK website. A simplified game or simulation could be created that would

give students the opportunity to engage with geospatial skills and concepts—such as route planning, hotspot analysis, and location suitability—in the context of urban or regional planning of a fictional area. Such an activity could incorporate not only the above skills, but also many of the careers highlighted on the Geospatial UK website, and ultimately allow students another opportunity to try out and engage with the types of work they could reasonably expect to do in the real world. Aside from being in line with students’ wishes for hands-on or interactive opportunities, it is also in line with peer-reviewed research indicating that interactive tools and learner-centered pedagogies are associated with increased student engagement and academic achievement, not only in social sciences or humanities (Agustini, Heriyawati and Mustofa, 2024; Fahrudin *et al.*, 2024; Ghai *et al.*, 2025; Sugden *et al.*, 2021), but also in maths (Fung, Tan and Chen, 2018; Liu 2024; Marhaeni, Arnal-Palacian and Irfan, 2024) and sciences (Cervenec *et al.*, 2022; David Agwu and Nmadu, 2023; Kaewunruen, 2019; Zainuddin *et al.*, 2020). Maps created through this simulation/game should be sharable in some type of gallery, highlighting the different choices that can be made with the same data.

Finally, Geospatial UK should pursue the funding necessary to actively maintain the website going forward. This includes maintaining the information on the site, such as the web map showing the locations of relevant higher education programmes, to make sure that it is accurate, as well as regularly updating the listed resources. This also includes maintaining contact with interested individuals through social media and a monthly or quarterly newsletter, which nearly 80 percent of teachers indicated that they would like to receive. This is also in line with standard marketing practices, as it is now the norm to actively engage with consumers through social media (Cao *et al.*, 2021; Trunfio and Rossi, 2021). Chen and Lien (2017) note that it is now “practically impossible to formulate marketing strategy without taking social networks into consideration,” with rational (rather than emotional) social media content driving more active engagement among users (Dolan *et al.*, 2019). For sample social media and newsletter content, see Appendix G.

Conclusion

Achieving the goals of closing of the current geospatial skills gap, as well as the diversification of the geospatial industry as a whole, will propel Scotland to becoming a major geospatial hub not just in Europe, but worldwide. However, there is still research and outreach that needs to be done in order to make this a reality. Data gathered from surveys shows that Geography teachers as a whole are well aware of the benefits and potential of geospatial skills, concepts, and data; teachers of other subjects are potentially less certain how geospatial can apply to their areas. Left unaddressed, this will severely impact the future growth of the geospatial industry. If a student believes that geospatial is only a geography concept, and either doesn’t enjoy or doesn’t engage with geography in school, the likelihood of them choosing a career in the geospatial

industry will be low. Results from the student surveys show that students come into the field from a variety of interests, but are often unsure of how to proceed with making connections, finding jobs, or learning more about the uses of geospatial data. In particular, students reported that making connections with professionals is the most difficult barrier to overcome. Incorporating the suggestions made for further geospatial exploration through contests, interactive simulations, and regular communication with interested parties can help give students experiences to draw on and the ability to make connections within the industry, thereby reducing or eliminating that barrier. These suggestions will ultimately encourage more students to pursue further studies and careers within the geospatial industry, which relates back to the first research question; furthermore, they will open doors for non-Geography teachers to incorporate geospatial skills and concepts into their classes as well, relating to the second research question.

Geospatial UK has an important role to play in this process, by providing students and teachers of all subject areas with the resources necessary to incorporate geospatial into the classroom. Geospatial UK also has a role in providing sufficient information to careers counselors in order for them to recommend the industry to students, including pathways into and through the industry, hard and soft skills that are useful for geospatial professionals, types of careers and salaries, job boards, and networking opportunities. With careful consideration and updates to capture the evolving nature of the geospatial industry, Geospatial UK can continue to inspire a new generation of geospatial professionals well into the future.

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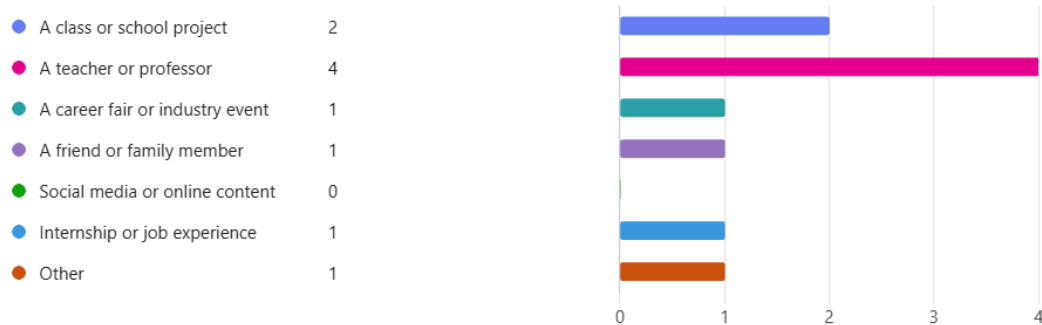
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Appendix A: Student Survey Results

1. How did you first hear about the geospatial industry? Select all that apply. If marking 'Other,' please explain.

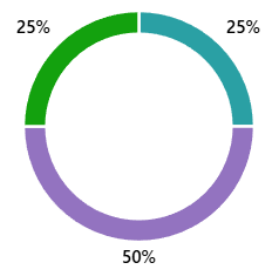
[More details](#)



2. At what stage in your education did you first become interested in geospatial topics?

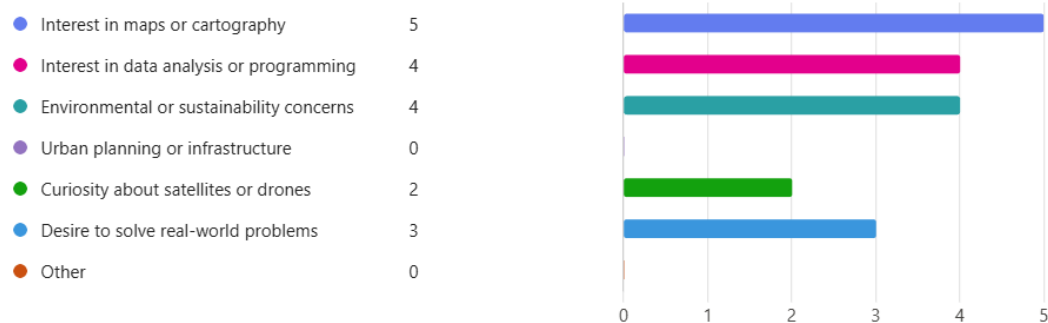
[More details](#)

Primary/elementary school (ages 5-10)	0
Middle school years (ages 11-13)	0
High school/secondary school (ages 14-18)	2
Early college/university	4
Late college/university	2



3. What initially sparked your interest in geospatial technologies? Select up to 3. If marking 'Other,' please explain.

[More details](#)



4. Who or what had the biggest influence on your interest in geospatial/GIS?

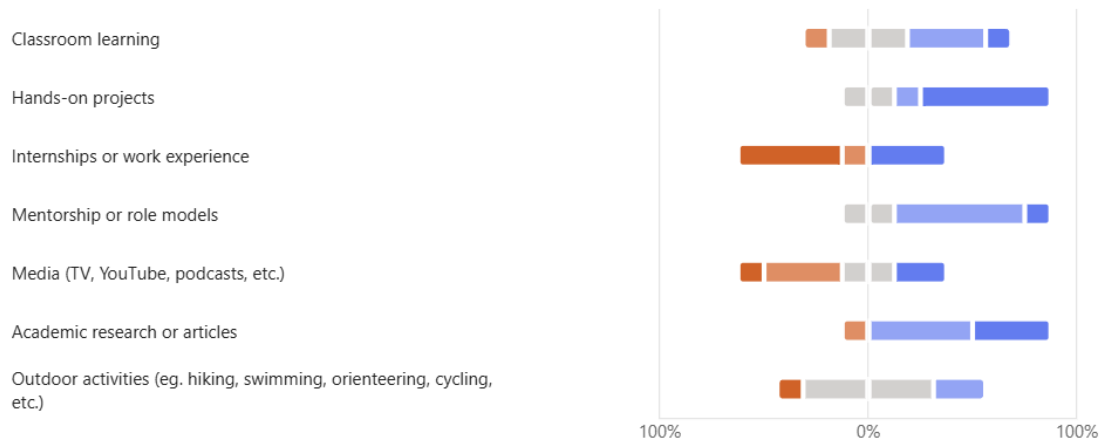
8 Responses

ID ↑	Name	Responses
1	anonymous	My dissertation supervisor at university.
2	anonymous	I first became interested in the geospatial industry through an undergraduate University project, which involved surveying a local greenspace. I think the biggest influence on my interest in GIS was my undergraduate professor who supervised this project. She showed that a career in GIS was fun and very varied - she regularly carried out side GIS and surveying projects in the summer alongside her main job. It seemed very interesting and so I implemented GIS more into my dissertation and then decided to study a Masters in GIS. I also did a significant amount of my own research in the benefits of a GIS career, and went to a couple of masters open days to learn more about the subject. This influenced me into pursuing a masters degree as it really helped to know more about the subject through talking to previous students and professors.
3	anonymous	Carleton College, Lacuna Fund, and NASA
4	anonymous	Work experience and seeing real world opportunities to use software and technology
5	anonymous	Desire to understand and solve the problem of disproportionality in foster care populations.
6	anonymous	The experience I had in my summer internship
7	anonymous	I had an intro remote sensing class in my undergrad and was really drawn in by the scale of data/analysis made available by satellite imagery
8	anonymous	Lecturer at university during my undergrad

5. On a scale of 1-5, where 1 is Not at all Important and 5 is Very Important, please rate the following in terms of the development of your interest in geospatial topics:

[More details](#)

● 1 - Not at all Important ● 2 ● 3 ● 4 ● 5 - Very Important



×

6. What challenges, if any, did you encounter when you were first learning about the geospatial industry/technologies?

8 Responses

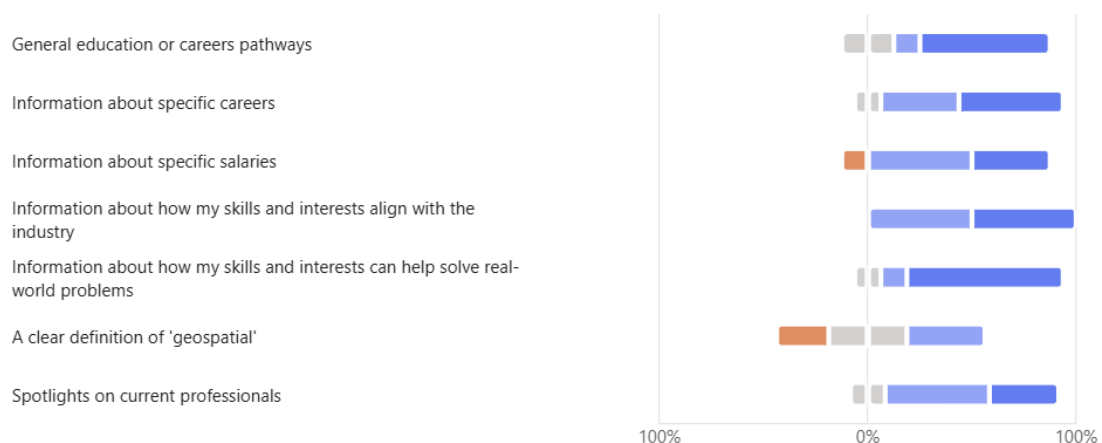
ID ↑	Name	Responses
1	anonymous	Having to learn to code and use maths which are not my natural strong suits!
2	anonymous	I encountered some challenge in figuring out what a career in GIS/ the geospatial industry could lead to. I knew about surveying and GIS analyst positions, but not about the more technical side which I have ended up pursuing. It would be great to have known more about database management, programming, interactive map, website development and generally routes into geospatial data science. I think because I did an archaeology undergraduate degree my knowledge of GIS was more skewed to analyst or surveying positions, but it would have been helpful to have a more well rounded view of GIS before starting my GIS masters. Most sources online that I found talked about environmental or surveying careers and less about the technical side, which I do find interesting but are not the full picture. More people might pursue a career in GIS/geospatial if they knew the full breadth of careers available, not just in surveying or analyst positions. GIS has great employment prospects and yet it is hard to find this information unless you already have an understanding of the subject or know someone that already studies GIS. I initially thought about studying a Data science conversion instead and it would have been great to know how you could incorporate this knowledge into a GIS career.

3	anonymous	Seemed like a niche community where very few people knew how to navigate and access resources and opportunities. But that quickly changed in the span of five to seven years. Now everyone is talking about ML, AL, Geospatial Tech. Crazy how things can change so fast.
4	anonymous	Without guidance or much knowledge of the industry it is difficult to understand the scope and opportunities available
5	anonymous	Geospatial seemed very new, and most people didn't have a basic understanding of it, which meant they couldn't provide meaningful advice.
6	anonymous	Various concepts such as projection and calculation
7	anonymous	I only discovered geospatial in my undergrad/by chance, and didn't really have much time/the opportunities to seek internships in this sector
8	anonymous	Developing skills in learning to use GIS software and related GIS tools (ArcGIS suite and Python)

7. On a scale of 1-5, with 1 being Very Unhelpful and 5 being Very Helpful, please rate the following in terms of information you had/would like to have had when first learning about geospatial skills and careers:

[More details](#)

● 1 - Very Unhelpful ● 2 ● 3 ● 4 ● 5 - Very Helpful



8. If there is other information that would have been helpful, but wasn't listed above, please explain and provide a rating. [More details](#)

1
Responses

Latest Responses

...

9. On a scale of 1-5, where 1 is Very Unhelpful and 5 is Very Helpful, please rate the following in terms of activities/things you had/would liked to have had when first learning about geospatial skills and careers. [More details](#)

● 1 - Very Unhelpful ● 2 ● 3 ● 4 ● 5 - Very Helpful



10. If there is something else that would have been helpful but wasn't listed above, please explain and provide a rating. [More details](#)

1
Responses

Latest Responses
...

11. Do you have any other comments or suggestions about how best to support young students as they explore geospatial skills and careers?

4 Responses

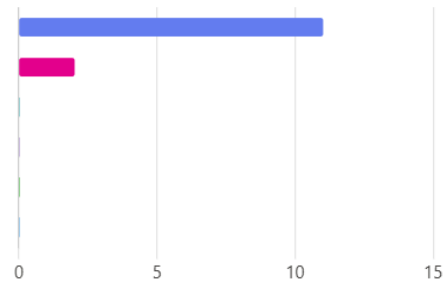
ID ↑	Name	Responses
1	anonymous	I'm not a teacher, but something that I really enjoyed whilst learning was the satisfaction of working through a problem (e.g. how am I going to get ArcGIS to wrangle with X) and seeing it run. I think if you can get some of that across to students then they'll hopefully want to do more.
2	anonymous	N/A
3	anonymous	Get 'em early!!
4	anonymous	Definitely more focus on expanding programming/coding skills (at least for EO)

Appendix B : Geography Teacher Survey Results

1. How well do you agree with the following statement?

Using geospatial skills (e.g. creating and interpreting maps, understanding of spatial relationships, etc.) can add value to my classroom. [More details](#)

● Agree	11
● Somewhat Agree	2
● Neutral	0
● Somewhat Disagree	0
● Disagree	0
● Don't Know	0



2. If you selected 'Disagree' or 'Don't Know,' please briefly explain the reason(s).

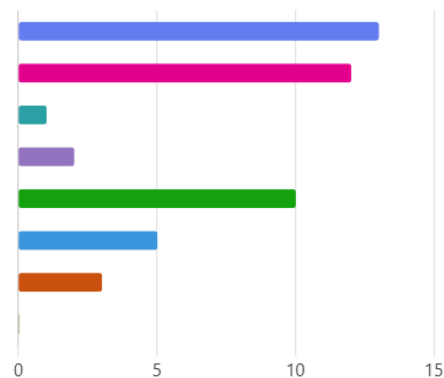
0 responses submitted

0
Responses



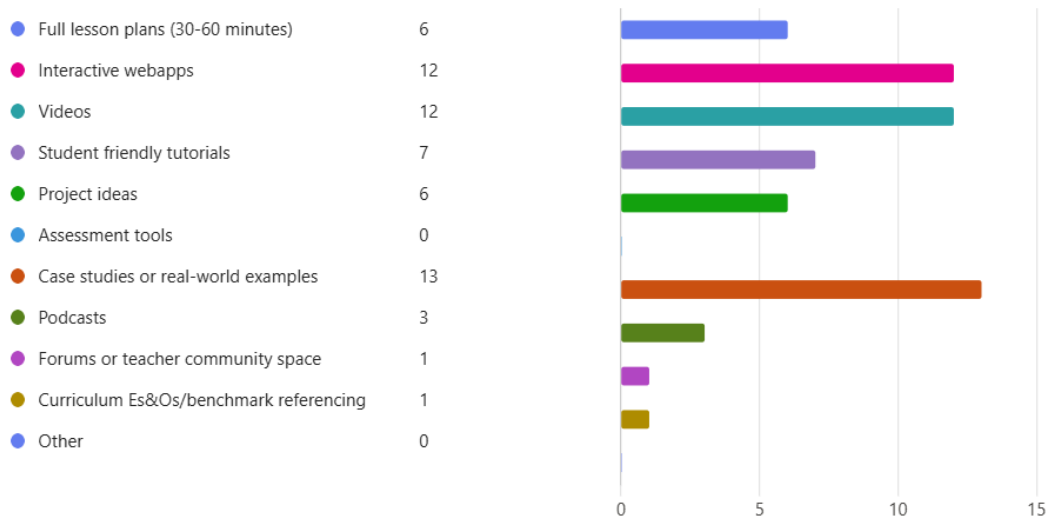
3. What features would you find helpful on an educational website regarding using geospatial skills in the classroom? [More details](#)

● Teaching resources	13
● Resource training guides	12
● Continuing education options	1
● eBooks about geospatial applications	2
● Regular newsletter about updates in geospatial skills for education	10
● Link to an ambassador programme	5
● Classroom posters	3
● Other	0



4. What types of teaching resources would you find most helpful for incorporating geospatial skills into your classroom?
Please choose your top 5 responses.

[More details](#)



5. How could an educational website support student engagement with mapping skills?

[More details](#)

13

Responses

Latest Responses

"interactive and hands-on"
"Show them that maps are fun"
"Make it fun and interesting"
...

5 respondents (38%) answered fun for this question.

regularly updated interests Geography and a range of other subjects wide-range mapping and map mapping relevant range of other subjects interactive and hands fun interactive jobs - see links different resources relationships between geography case studies links between Geography world applications

6. What topics would you like to use geospatial tools for?

[More details](#)



7. Please rank the following student outcomes from Most Important to Least Important.

[More details](#)

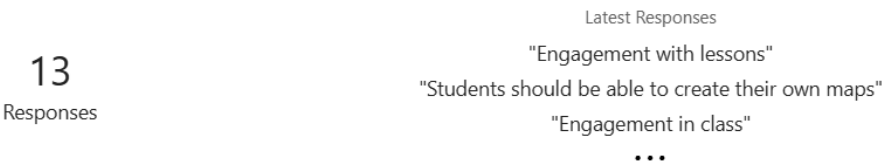


8. Please rank the following *geospatial skills* student learning outcomes, from Most Important to Least Important.

[More details](#)



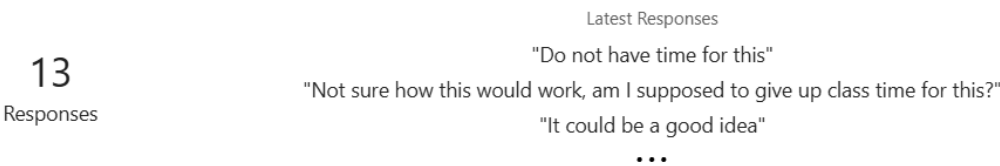
9. What other student outcomes would you expect or want to see from incorporating geospatial skills and tools into the classroom? [More details](#)



5 respondents (38%) answered Higher for this question.



10. What are your thoughts on creating opportunities to collaborate with non-Geography teachers on teaching geospatial skills? [More details](#)



6 respondents (46%) answered time for this question.



11. Do you have any other comments or suggestions to support this work?

[More details](#)

5
Responses

Latest Responses
"Great questions, thank you!"
...

2 respondents (40%) answered Great for this question.



12. If you would be interested in a short follow-up interview or conversation, please leave your name and email address below:

0
Responses

0 responses submitted

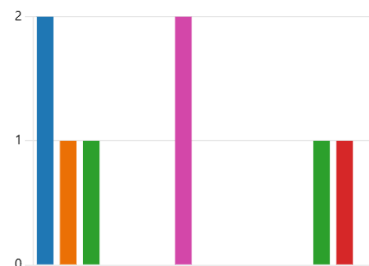
Four horizontal lines for text input, followed by three dots indicating more options.

Appendix C: Non-Geography Teacher Survey Results

1. What subject do you teach?

[More Details](#)

History	2
Biology	1
Geology/Earth science	1
Physics	0
Chemistry	0
Art/Design	0
Maths	2
Physical Education/sports	0
Health/well-being	0
English language/literature	0
Technology	0
Modern Studies	0
Business studies/Enterprise	1
Computing/ICT	1
Other	0

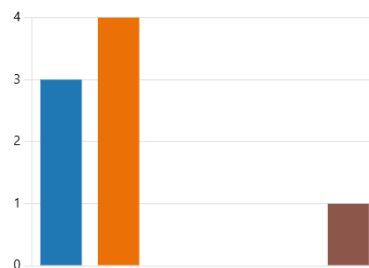


2. How well do you agree with the following statement:

Using geospatial skills (e.g. creating and interpreting maps, understanding of spatial relationships, etc.) can add value to my classroom.

[More Details](#)

Agree	3
Somewhat Agree	4
Neutral	0
Somewhat Disagree	0
Disagree	0
Don't Know	1



3. If you selected 'Disagree' or 'Don't Know,' please briefly explain the reason(s):

[More Details](#)

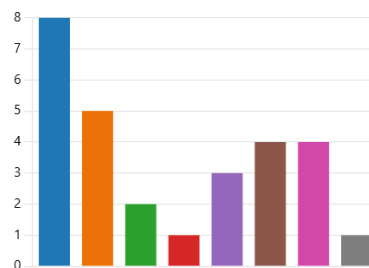
1
Responses

Latest Responses
"don't know"

4. What features would you find helpful on an educational website regarding using geospatial skills in the classroom?

[More Details](#)

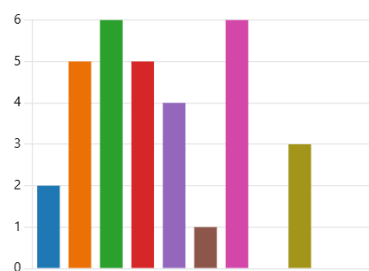
Teaching Resources	8
Resource training guides	5
Continuing education options	2
eBooks about geospatial applic...	1
Regular newsletter about updat...	3
Link to an ambassador program...	4
Classroom posters	4
Other	1



5. What types of teaching resources would you find helpful for incorporating geospatial skills into your classroom? Please choose your top 5 responses.

[More Details](#)

Full lesson plans (30-60 minutes)	2
Interactive webapps	5
Videos	6
Student friendly tutorials	5
Project ideas	4
Assessment tools	1
Case studies or real-world exam...	6
Podcasts	0
Forums or teacher community s...	3
Curriculum Es&Os or benchmar...	0
Other	0



6. How could an educational website support student engagement with mapping skills?

8 Responses

1	anonymous	A GIS based app where students learn about different projections would be interesting. Apps like Desmos are fantastic for exploring real world applications such as 3D coordinates, straight line (land the plane comes to mind), trigonometry, vectors etc
2	anonymous	Students can interact and see why these skills are important for after leaving school
3	anonymous	Relevance to subject area- e.g Historical maps would be interesting and make the subject come alive in a different way.
4	anonymous	Provide them with opportunities to learn new things, see how topic connects with things they care about
5	anonymous	It could show students the types of things that can be mapped, give them an easy introduction to the topic
6	anonymous	give them the opportunity to map something
7	anonymous	not sure
8	anonymous	I'm not sure

7. What topics would you like to use geospatial tools with?

8 Responses

ID ↑	Name	Responses
1	anonymous	Coordinates 2D and 3D, vectors, straight line, quadratics, trigonometry.
2	anonymous	Unsure
3	anonymous	We use maps a lot in History- looking at historic maps, borders, how maps have changed etc.
4	anonymous	coding
5	anonymous	battle plans, historical demographics
6	anonymous	ecological surveys, climate change
7	anonymous	climate change
8	anonymous	don't know

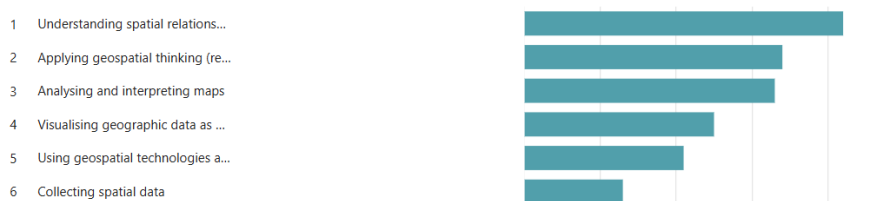
8. Rank the following student outcomes from Most Important to Least Important

[More Details](#)



9. Please rank the following *geospatial skills* student learning outcomes, from Most Important to Least Important.

[More Details](#)



10. What other student outcomes would you expect or want to see from incorporating geospatial tools into the classroom?

4 Responses

ID ↑	Name	Responses
1	anonymous	Awareness of wider society and the interconnectedness between history/geography/real life- not all in subject disciplines but how they link together.
2	anonymous	I don't know
3	anonymous	n/a
4	anonymous	better understanding of current issues

11. What are your thoughts on taking advantage of opportunities to collaborate with Geography teachers on teaching geospatial skills?

7 Responses

ID ↑	Name	Responses
1	anonymous	Would love to, geography is my other teaching subject and I worked with GIS in offshore oil and gas industry for over a decade. I regularly tell my students about real world applications of topics they are learning
2	anonymous	Working with other practitioners is always welcome!
3	anonymous	Open to it
4	anonymous	not sure
5	anonymous	Not sure how it would work, but not opposed to this
6	anonymous	I already have a lot to cover, not sure where this would fit
7	anonymous	Not interested

12. Do you have any other comments or suggestions to support this work?

4 Responses

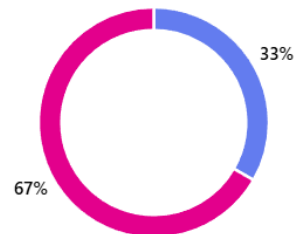
ID ↑	Name	Responses
1	anonymous	great job!
2	anonymous	thank you!
3	anonymous	Thanks!
4	anonymous	Why is this relevant to me?

Appendix D: Careers Counsellor Survey Results

1. How familiar are you with the concept of *geospatial* skills and technologies?

[More details](#)

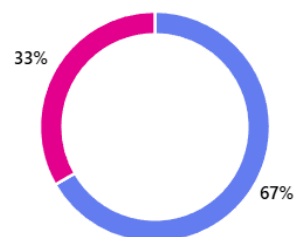
● Not at all familiar	1
● Somewhat familiar	2
● Very familiar	0



2. How familiar are you with the types of *careers* that use geospatial skills and technologies? (*Examples: GIS analyst, urban planner, environmental consultant, drone operator, cartographer*)

[More details](#)

● Not at all familiar	2
● Somewhat familiar	1
● Very familiar	0



3. Have you ever recommended a geospatial related career (ie. GIS analyst, urban planner, drone operator, cartographer, etc.) to a student?

[More details](#)

● Yes	0
● No	3



4. If you answered no to the previous question, why not?

3 Responses

ID ↑	Name	Responses
1	anonymous	Don't know about jobs or industry
2	anonymous	don't know what these are
3	anonymous	Was not sure how to describe the field and why it would be of interest to them

5. Please rank these types of information in order by how helpful they would be for guiding students towards geospatial careers, from Most Helpful to Least Helpful

[More details](#)



6. Are there any other types of information that would be useful in recommending geospatial careers?

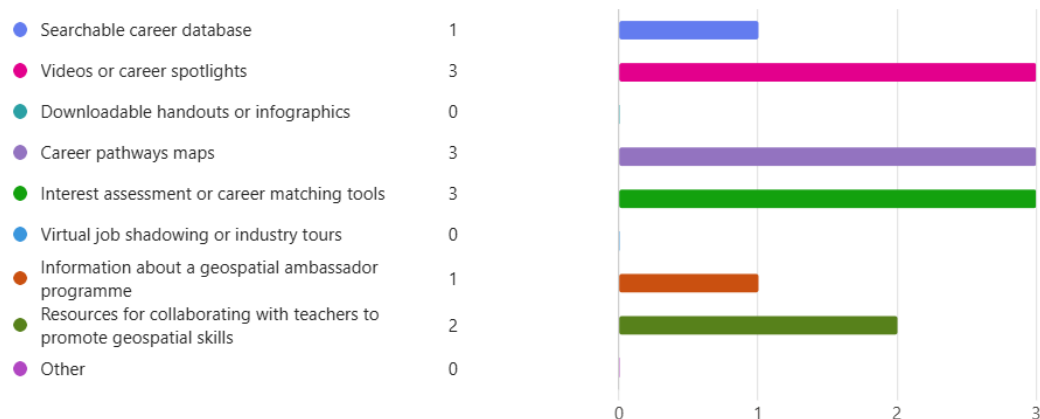
[More details](#)

1
Responses

Latest Responses
"N/A"

7. What types of features would make a geospatial careers website valuable for your work with students?

[More details](#)



8. Would you be interested in a tool that shows how geospatial skills align with student interests (e.g. tech, outdoors, sustainability)? [More details](#)



9. What would make a geospatial career website most helpful for your role?

3 Responses

ID ↑	Name	Responses
1	anonymous	info about jobs and salaries
2	anonymous	easy answers to questions, informative, regularly updated with new information
3	anonymous	Comprehensive and up to date, easy to navigate

10. What challenges or barriers do you face when trying to introduce students to lesser-known career fields?

3 Responses

ID ↑	Name	Responses
1	anonymous	convincing students that goals are attainable, that they have the skills needed to succeed
2	anonymous	How to get students interested
3	anonymous	Lack of information

11. Do you have any other comments or suggestions to support this work? [More details](#)

1
Responses

Latest Responses
"Thanks for the work you're doing!"

12. If you would be interested in completing a follow-up interview or conversation, please leave your name and email address below.

0

Responses

0 responses submitted

Appendix E: Site Analysis of Geospatial UK, Dated 20/05/2025

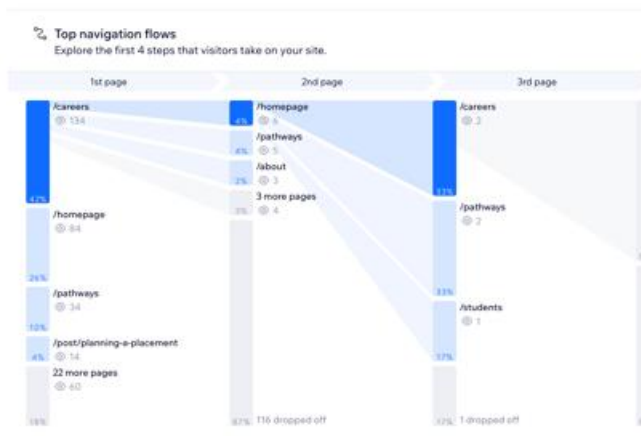


The Careers page is the most visited page on the site, homepage second, pathways third.

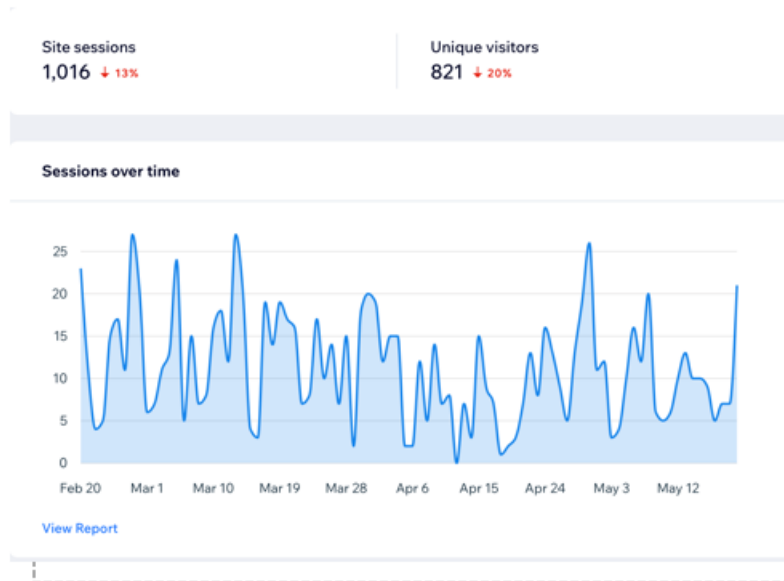
Very high bounce rate so people are jumping off the site quite quick after landing on it.

Avg. session duration 8m 43s ↑ 3%	Avg. pages per session 1.4 ↑ 2%	Bounce rate 📘 78.5% ↑ 2%
---	---	---

Those that do stay are there for 8mins which is high but this might be the recent review of the content.



Customer journey around the site.



Strong peaks on visitor demographics over the last 3 months



Traffic is coming in via organic search ie Google search, yahoo etc. Not much via social and email marketing

Organic search

Manage Site SEO

Sessions

686

+ 22%

Impressions

43,039

+ 2,809

Clicks

494

+ 198

CTR

1.1%

+ 0.4

Top search queries

Search queries by growth

Top pages in search results

Google Search Console

Query	Impressions	Clicks [↓]	CTR	Average position
geospatial	7,766 ^{↑ 77}	66 ^{↓ 25}	0.8% ^{↓ 0.3}	34.8 ^{↑ 5.5}
geospatial jobs	684 ^{↓ 25}	41 ^{↓ 6}	6.0% ^{↓ 0.6}	7.1 ^{↓ 1.8}
geospatial uk	47 ^{↑ 7}	21 ^{↑ 5}	44.7% ^{↑ 4.7}	1.0
geospatial jobs uk	155	12 ^{↑ 3}	7.7% ^{↑ 1.9}	3.7 ^{↓ 0.3}

Keywords driving traffic to the site.

Appendix F: Table of Site Changes to Geospatial UK

Round of Changes	Page	Section	What is Being Done	Justification	What Do I Need to Complete This
First	About	Our Mission	- Additional text needed	Text should be more detailed about the 'why' behind this website.	N/A
First	Home	Navigation bar	- Remove additional Home page button – keep picture, not text - Will need to be done on all pages	Do not need two of these.	N/A
First	Home	Navigation bar	- Switch order of links	Better website flow	N/A
First	Home	Contact & Social Media	- Update contact information on all pages - Remove or replace social media with updated versions – Facebook: GeospatialUK – Twitter/X: UKGeospatial – LinkedIn: Geospatial UK – YouTube: Geospatial UK – Spotify: Geospatial UK	Contact information should be up to date. Social media should direct interested parties to feeds/accounts that are being actively maintained.	Updated contact information for new administrators. Updated social media profiles—either need to work with Newcastle for old ones or create new ones. Can develop list of types of posts specific to different formats of social media. Should consider adding different platform? Bluesky?

Round of Changes	Page	Section	What is Being Done	Justification	What Do I Need to Complete This
First	Home		- Add sidebar navigation for each page	Several pages are extremely long, and it can be difficult to find what you are looking for by simply scrolling.	N/A
Second	All pages		- Change button text to be more descriptive throughout	Better suits accessibility requirements	N/A
Second	About	We are Geospatial UK	- Updated text to remove references to Newcastle, insert references to University of Edinburgh, LDS, and Fife College - Updated text to add context for Scottish geospatial sector	Text should support mission of LDS, Fife College geospatial skills programme, University of Edinburgh	Additional information needed on current geospatial industry figures. See LDS site, 2024 UK Geospatial Commission Report
Second	About	How Can We Help?	- Updated text to highlight elements of this new initiative	Text should be more detailed/less vague. Should not highlight experience of sponsors we don't know will want to continue. Should not make it sound as if G-UK is an organization.	N/A
Second	Careers	Introduction	- Additional text/context needed	Information should be updated to include latest facts/figures.	

Round of Changes	Page	Section	What is Being Done	Justification	What Do I Need to Complete This
Second	Home	Geospatial UK	- Update text for Goals/Purpose to add more context - Make text Scotland-centric	Purpose of website needs to be more explicit	Updated facts and figures – see LDS site, 2024 UK Geospatial Commission Report
Second	Home		- Consolidate definition of geospatial from Student and Teacher pages onto Home page	Do not need two identical definitions on different pages. They should be on the front page, setting the context for the whole website.	N/A
Second	Home	What We Do	- Update geospatial data figures	Figures potentially out of date, and/or don't emphasize Scotland	Updated facts and figures – see LDS site, UK Geospatial Commission Report (?)
Second	Home	Students	- Remove references to KS4-5	Text needs to be inclusive of Scottish school system	Additional information on Scottish school system
Second	Home	Teachers	- Remove references to KS4-5	Text needs to be inclusive of Scottish school system	Additional information on Scottish school system
Second	Pathways	Get Qualified	- Remove link to The Survey School	Does not align with intention to promote diverse interests in geospatial industry	N/A

Round of Changes	Page	Section	What is Being Done	Justification	What Do I Need to Complete This
Second	Resources	Resources	- Update text to remove references to KS4-5 classes	Text should be inclusive of Scottish school system	Additional information on Scottish school system
Second	Resources	eBooks	- Remove ESRI book	This is not something that teachers are likely to use in class, per teacher survey results.	N/A
Second	Students	For Students	- Remove references to KS4-5? Add references to S4-6?	Website needs to be inclusive of Scottish school system.	Additional information on Scottish school system
Second	Students	Uses of GIS for Science	- Remove ESRI book/viewer	Possibly too advanced for students, but might be interesting for careers counsellors	N/A
Second	Teachers	Pop-up	- Remove or make sure that contact goes to the correct place	If teachers want to use an option to get in touch with someone, the request needs to go to someone who will see it and respond. Ultimately removed as there is currently no one to go to schools.	Find out what email this goes to, and make sure it is a monitored email address. Replace with new email address if necessary.
Second	Teachers	For Teachers	- Remove references to KS4-5	Website needs to be inclusive of Scottish school system.	Additional information on

Round of Changes	Page	Section	What is Being Done	Justification	What Do I Need to Complete This
					Scottish school system.
Second	Teachers	What Does Geospatial Mean?	- Update statistics about geospatial industry	Figures potentially out of date, and/or don't emphasize Scotland	Updated facts and figures about geospatial industry
Second	Teachers	Why is GIS so Important?	- Update language to reflect term geospatial - Update text	Need to make sure that facts and figures are up to date, and that language is consistent across the website.	Updated facts and figures about geospatial industry
Second	Teachers	Uses of GIS for Science	- Remove ESRI book/viewer	Not directly relevant to teaching, though may be interesting for careers counsellors. Per teacher survey, teachers are unlikely to use this.	N/A
Second	Teachers	Inspire the Next Geospatial Experts	- Remove Get Kids Into Survey Project - Remove D.E.C. programme	Projects/programmes out of date and are not aligned with diverse fields of study	N/A
Second/Third	About	Our Partners	- Update sponsor list - Condense company info and links	Website should highlight organizations that are contributing to this work/initiative.	Add new sponsors (LDS, University of Edinburgh, Fife College). Remove sponsors that don't wish to remain.
Second/Third	Careers	Careers	- Add more job profiles	Information should be updated to show a diverse	Additional job profiles, information

Round of Changes	Page	Section	What is Being Done	Justification	What Do I Need to Complete This
			- Diversify range of jobs to be less surveyor-heavy - Possibly searchable based on interests or skills? - Update salaries - Remove geospatial careers quiz - Update pictures/quotes to be less surveyor-based - Remove 'Become a Surveyor' and 'Careers in GIS'	range of career options. Resources that point students specifically towards the surveying industry should be removed.	about current salary expectations. Job profiles can possibly be turned into a feature that matches jobs with student skills or interests by assigning each job 3-4 attributes and creating a search function for them. Need to create a master list of jobs and skills.
Second/Third	Careers	Geospatial Jobs	- Additional text needed - Remove link to geospatial careers quiz	Information about jobs should be up to date. Information should speak	Additional information needed
Second/Third	Home	Sponsor List	- Updated sponsors	New sponsors may be added, old sponsors may be removed	Names and text of additional sponsors. Old sponsors should be contacted to see if they still want to be listed as sponsors.

Round of Changes	Page	Section	What is Being Done	Justification	What Do I Need to Complete This
Third	Careers	Hear from Industry Professionals	- Remove most surveyor videos, keep one on GIS as career – possibly move to another section - Remove link to The Survey School	Does not meet goal of encouraging diverse interests and skills within geospatial industry. Ultimately removed, as new site administrators do not wish to pay for plug-in to allow these videos.	N/A
Third	Careers	Find Your New Career	- Adding window to current live job search site - Keep AGI Early Career Network - Additional links added	There are further resources out there than just these ones. Adding in the viewer window will allow for interactive elements on an otherwise static page.	Research on more job search sites, professional bodies, and networking groups.
Third	Home		- Add in chatbot	Can help field basic questions, which per literature is beneficial for organizations with little to no manpower.	Will need to compile training documents and research chat bots.
Third	Home	Read the Latest	- Remove this section? Will need to be removed from each page	Blog hasn't been updated in years, no plans for blog posts in near future. Can be added back in when needed.	Can develop list of potential ideas for blog posts in the future?
Third	Home	Newsletter	- Remove or replace newsletter sign-up on all pages	Newsletter should be used to reach out to wider audience, and drive	Create sample newsletter, and list of potential topics

Round of Changes	Page	Section	What is Being Done	Justification	What Do I Need to Complete This
			- If keeping, make sure email sign up is updated	engagement back to website.	
Third	Latest		- Remove page	Other links to this page have been removed. This page has not been updated in 3 years, and so there is nothing current on them. Page can be added back in when it is up to date.	N/A
Third	Pathways	What Are My Options	- Include information about Fife College programme - Update information about university costs - Update T Levels and Apprenticeships information - Add in pathways roadmap	Information needs to include Scottish school system, and have a way to differentiate this from UK school system.	Additional information needed on Scottish school system. Will need to create pathways roadmap for Scottish/UK school systems through Adobe Illustrator or similar. Will need information on Fife College programme.
Third	Pathways	Geospatial Degrees in UK and Ireland	- Update universities and programmes - Highlight University of Edinburgh and Fife College	Information about geospatial programs needs to be reflective of current availability.	Additional information needed on current geospatial university and college

Round of Changes	Page	Section	What is Being Done	Justification	What Do I Need to Complete This
			- Update or remove pictures/quotes		programs. New map will need to be coded and inserted into website, as current map utilises plug-in.
Third	Pathways	Find Out More About Studying At University	- Remove current videos - Add in videos from Fife College programme	Current videos are about surveying, or are classroom lectures that are unlikely to be watched.	Additional videos from Fife College.
Third	Resources	Activities	- Remove construction videos - Remove ESRI instruction videos - Add in online/web-based geospatial resources to separate section from lesson plans	Resources should be easy applications that teachers can incorporate into their own lessons rather than full lesson plans that they may not have time for (Janes, 2023)	Need list of online-based geospatial resources. Need additional resources for art/math.
Third	Resources	Podcasts	- Remove podcasts – potentially move them to Careers or Student page?	Podcasts likely do not fit into teacher's lesson plans, but could be interesting for students or parents?	N/A
Third	Resources	Free posters	- Add additional resources	Can add additional classroom design resources	Need to search for additional classroom design

Round of Changes	Page	Section	What is Being Done	Justification	What Do I Need to Complete This
Third	Students	Opportunities	- Remove or replace rotating viewer with up-to-date opportunities - Will also need to be done on Careers page	Opportunities need to be up to date.	Additional opportunities for students – programmes, scholarships.
Third	Teachers	Free GIS Software	- Need training guide for Google Earth - Remove QGIS - Move to resources page?	Teachers and schools are unlikely to download and learn entirely new platforms, especially ones with steep learning curve	Locate or create training guide for geospatial tools in Google Earth.
Third	Teachers	Free Training Resources	- Move training guides next to the software they're for	Training guides should be closer to the programs they're meant for, otherwise teachers are unlikely to use them. Teachers don't have a lot of time to dedicate to learning new programs.	N/A
Third	Teachers	External Organizations	- Move CPD courses to their own section? - Update CPD with timely resources - Remove email for suggesting improvements?	CPD courses shouldn't be buried in the middle of another section.	Update with information about current CPD opportunities.
Third	Teachers	Opportunities	- Update conferences and trainings	Opportunities should be inclusive of Scottish school system. GA requires payment to	Additional research needed on CPD opportunities.

Round of Changes	Page	Section	What is Being Done	Justification	What Do I Need to Complete This
			- Remove Geographical Association Quality Marks link	access geography department self-assessment.	
Third	Mobile Version	All pages	- Make sure that mobile version is legible – all elements clearly visible - Reduce large blocks of text - Hide any elements that are non-responsive to mobile - Change header menu to sandwich menu	Elements may have gotten smushed together, or not be in correct places. Large blocks of text are not effective on mobile, per literature. Sandwich menu better for finger taps as opposed to mouse clicks.	N/A

Appendix G: Sample Newsletter and Social Media Content for Geospatial UK

Potential Newsletter Names

Tone: Professional		
GeoBrief	The Geospatial Digest	The Raster
MapLine	GeoWatch	Spatial Monthly (Quarterly?)
Beyond the Map	Spatial Matters	The Waypoint
Vector & Raster	The Coordinates	Worldview
The World in View	Geo Updates	Earth Intel
CRS Chronicles	Point of Interest	Geo Narrative

Tone: Playful and Funny		
Zoom In!	Lat/Long Letters	The Compass
The Legend	Under the Layers	Map Appetit
The Friendly Geographer	The Coordinate Club	The Longitude Lounge
Map Mode	Layer by Layer	Pan, Zoom, Repeat

Tone: Professional with Personality		
Map Matters	The Mapping Angle	Spatial Signals
The Map Room	On the Grid	Across the Map
Edge of the Map	Place & Space	Lines & Legends
Projection & Perspective	The Spatial Current	Earth in Focus

Potential Newsletter Topics

General or Recurring Topics		
Local Events	Career Spotlights	Map of the Month!
Career Interviews	Real-world Applications	Resource Spotlight
Innovation & Future Trends	Space and Satellites	Map Skills 101
Cartoon Caption Contest	Upcoming Internships or Summer Programmes	Famous Places from Above Satellite Challenge
Teacher Toolkit	Project Ideas	Reader Submissions

Topics by Month		
<i>January – New Year, New Worldviews</i>	<i>February – Love Where You Live</i>	<i>March – Women in Geospatial</i>
How Maps Shape our Views	Place-based Learning	Resources for Girls
Intro to Careers and Mapping	Mapping Local Communities	Spotlight: Women in Geospatial
Skills to Try This Year	Careers in Urban Planning	Why STEM Diversity Matters

Cool Mapping Tools to Try	Geography of Love: Valentine Maps	Map of the Month: Women who Geographically Changed the World
---------------------------	-----------------------------------	--

<i>April – Earth from Above (Earth Month)</i>	<i>May – Navigation and Exploration</i>	<i>June – GeoTech & The Future</i>
Remote Sensing 101	History of Wayfinding	Emerging Tech in Mapping
Mapping and Climate Action	Cartography Projects for Students	Student Projects that use Mapping
Earth Observation Careers	Map Literacy Skills	Geo Careers for the Future
Create a Classroom Eco-Map Project	Explorers & Mapmakers who Changed History	Geo Summer Camps and Internships

<i>July – Maps in Motion</i>	<i>August – Back to School Spatial Skills</i>	<i>September – Geography and Society</i>
Fun Summer Activities	Using GIS in the Classroom	GIS for Social Good
Tracking Travel, Migration, and Movement	Building Students Mental Maps	How Maps Influence Politics and Power
National Mapping Week	Why Map Skills Still Matter	Role of Geography in Social Studies
BTS: How Travel Apps Use Geospatial	Teacher Toolkit: Activities to Kick off the Year	Census, Demographics, and Mapping People

<i>October – Spooky Spatial Science</i>	<i>November – 30 Days of Mapping</i>	<i>December – Mapping the Year</i>
Paranormal Places and Haunted Maps	Daily Map Challenge Highlights	Top Maps of the Year
Crime Mapping & Forensics	Behind the Maps: Stories of Data Creation	Geospatial Year in Review
Scary Map Projections	Student/Teacher Map Submissions	Festive Geography: Winter Around the World
Mystery Maps: Student Challenge	How to Participate in Mapping Challenges	Planning Goals for Next Year

Sample Social Media Content

Platform	Ideal Post Types	Tone	Audience	Post Ideas
X (Twitter) or Bluesky	– News – Quick updates – Blog posts – Visual components	– Curious – Conversational – Community-driven	– Students – Teachers – The geo-curious – STEM professionals	– Geo facts – Satellite photography – Countdown posts – Ex. 5 days until GIS Day! Here's how to bring it to your classroom! – Map of the Day/Week/Month – Polls – Ex. What would you rather explore? A volcano in 3D? A shipwreck? A historical map archive? – Threads – Ex. 5 fun GIS tools to use with your students! – Links to YouTube content – Resource share
FaceBook	– Short videos and curated content – User-generated content – Content related to events	– Community-driven – Friendly – Shareable – Informative	– Parents – Teachers – Local groups – School pages	– “Did You Know...?” – Discussion prompts – Ex. Teachers, how do you use maps in your classroom? Share your favourite ideas! – Local or online events – Parent outreach – Ex. Curious how your child's interest in gaming could lead to a career in mapping or geospatial? Let's connect the dots!

Platform	Ideal Post Types	Tone	Audience	Post Ideas
				– Photo albums – <i>Ex.</i> Check out these student maps from Ms. Smith’s class!
YouTube	– Longer educational videos	– Educational – Story-driven – Visual and engaging – Explainer-style	– Teachers – Students – Careers Counsellors	– Explainer video – <i>Ex.</i> What is geospatial? Why does it matter? – Mini Series – <i>Ex.</i> Careers, people, maps – Tutorials – Interviews – <i>Ex.</i> Career spotlights with current geospatial professionals – Quick Tips – <i>Ex.</i> “5 Mapping Tools in Under 5 Minutes” – Vlogs – <i>Ex.</i> “Come with me as we explore the RSGS Map Room”
LinkedIn	– Professional insights – Industry-related discussions	– Professional – Career or education focused – Informative – Aspirational	– Educators – Careers Counsellors – School leaders – STEM professionals	– Career highlights/interviews – <i>Ex.</i> Career spotlights with current geospatial professionals – Industry insights – <i>Ex.</i> “The geospatial industry is projected to grow 10.5% this year. Here’s how teachers can help students prepare” – Resource share – Partnership calls – Engagement posts

Platform	Ideal Post Types	Tone	Audience	Post Ideas
				– <i>Ex.</i> “What was the last map you used not for directions? Let’s talk map literacy”
Cross-platform Ideas				– #MapMondays – Behind the Scenes – <i>Ex.</i> Share process behind a map, student project, or tech – GeoChallenges – <i>Ex.</i> Short challenges for the classroom or home – Teacher Takeovers – <i>Ex.</i> Sharing wins in teaching with geospatial – Career Spotlight Days – <i>Ex.</i> Student-friendly interviews and/or job posts

Part II: Supporting Documents

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1. Introduction

The Geospatial UK website was identified in 2023 as an avenue for broadening the teaching and use of geospatial skills, concepts, and technologies in Scottish secondary schools (Janes, 2023). Geospatial UK was initially created in 2021 by the University of Newcastle, for the purpose of “broadening awareness and understanding of geospatial skills and technologies, and its applications for the future” (Geospatial UK, 2023). In its initial form the website features pages specifically for students and teachers, as well as teaching resources. There are also pages for geospatial careers and general information on pathways into the geospatial industry. Overall, in its initial form Geospatial UK presented a solid foundation from which to build.

However, numerous additions, changes, and updates needed to be made to the Geospatial UK website in order to make it useful for its new administrators, Location Data Scotland (LDS) and AGI Scotland (AGI-S). Similar or identical content was repeated in multiple places on the website, and overall the focus was to drive engagement with the surveying industry in particular. Additionally, though the title of the website is Geospatial UK, there was no acknowledgement of different school systems and their requirements found within the UK, or pathways into the geospatial industry for anyone other than residents of England. While this met the requirements of University of Newcastle, whose academic programmes were heavily focused on geospatial within surveying, this does not meet the requirements for the new website administrators going forward. This technical report outlines the additions, updates, and changes that were made to Geospatial UK, and connects those back to the initial goals for the website as described in the research paper.

2. Surveys

Before undertaking the task of updating Geospatial UK, efforts were made to understand the needs and wishes of the three target audience groups—students, teachers (split into Geography teachers and non-Geography teachers), and careers counsellors. Surveys have long been a mainstay of social research (Jentoff, 2019), and even geospatial/GIS in particular (Kerski, 2001; Lam *et al.*, 2009; Olsen, 2002; Yap *et al.*, 2008). Market research-style surveys allow for the opportunity to ask specific groups for their opinions (Hulland, Baumgartner and Smith, 2018), so this was the survey format that was chosen.

Teachers were split into two groups, Geography teachers and non-Geography teachers. The reasoning behind this was to specifically track the responses of non-Geography teachers. It has been noted that GIS and geospatial have long been seen as the domain of geography teachers (Muniz, Demirci and van der Schee, 2015), and studies have confirmed that geography teachers in general have a very positive outlook on the use of geospatial in the classroom (Janes, 2023). Comparatively less research has been done

on the attitudes of non-geography teachers towards geospatial, however. Given that the one of the goals of Geospatial UK is to reach out to non-Geography teachers, their survey responses must be catalogued separately; that way, their specific needs and wishes can be incorporated into the final website version. Otherwise, their responses run the risk of getting lost within the responses from Geography teachers, which are expected to be overwhelmingly positive.

All surveys were created using Microsoft Forms and sent to the Ethics Committee within the School of GeoSciences at University of Edinburgh for approval. In general, all four surveys asked about general attitudes towards geospatial concepts and skills, and overall features they would find useful on an educational website about geospatial. All surveys were kept short, around 10 questions and a total time for completing the survey under 10 minutes. This is due to the fact that studies show survey participation is inversely proportional to how long the survey takes to complete (Saleh and Bista, 2017). All of the surveys were broken into several sections, in order to group related questions together. The student survey was broken down into four sections: Initial Exposure to Geospatial, Motivations and Influences, Challenges and Barriers, and Final Comments. Both teacher surveys were broken down into the same six sections: Understanding Your Perspective on Geospatial Skills, Designing a Supportive Geospatial Skills Website, Understanding Desired Student Outcomes, Working with Other Educators, Final Comments, and Closing/Request for Interviews. The survey for careers counsellors was also broken into six sections: Understanding Your Experience with Geospatial Careers, Identifying Your Information Needs, Designing a Supportive Careers Website, Understanding the Challenges You Face, Final Comments, and Closing/Request for Interviews. Individualised questions for each focus group can be found below in the relevant section.

2. 1 Student Survey

The student survey was intended for current students who are engaged in geospatial-related programmes in secondary school, college, or university. Aside from the standard questions, students were also asked about what first brought them to geospatial and at what educational level and what would have been helpful for them as they first got started. This survey was sent out via email to University of Edinburgh's School of GeoSciences Geographical Information Science and Earth Observation and Geoinformation Management MSc 2024-2025 cohort, students in Fife College's Geospatial Skills Programme, and students at George Heriot's School in Edinburgh, Scotland. For the full student survey, see Appendix A.

2.2 Geography Teachers Survey

The Geography teachers survey was intended for current geography teachers in Scotland, regardless of whether they incorporate geospatial concepts and skills into their classrooms or not. Teachers were asked about their thoughts on reaching out to

non-Geography teachers and careers counsellors for collaborative work or opportunities, what types of resources they would find helpful on Geospatial UK, and what learning objectives and outcomes they are most looking to accomplish with geospatial. This survey was sent out to current geography teachers in Scotland through Location Data Scotland, as well as to teachers via email at George Heriot's School in Edinburgh. For the full Geography teachers survey, see Appendix B.

2.3 Non-Geography Teachers Survey

The non-Geography teachers survey was intended for current teachers of non-geography subjects in Scotland, regardless of whether they incorporate geospatial concepts and skills into their classrooms or not. Teachers were asked about their willingness to collaborate with Geography teachers for projects that might overlap their subjects. While this is very similar to the question for Geography teachers, the wording of the question mostly puts the onus on Geography teachers to reach out to their non-Geography colleagues. This seemed logical, based on Geography teachers possibly being more aware of the potential for geospatial than non-Geography teachers. Teachers were also asked about what types of resources they would find helpful on Geospatial UK, and what learning objectives and outcomes they are most looking to accomplish with geospatial. This survey was sent out to current non-geography teachers in Scotland through Location Data Scotland, to teachers via email at George Heriot's School in Edinburgh, and posted to an official Scottish Maths Teachers FaceBook group. For the full non-Geography teachers survey, see Appendix C.

2.4 Careers Counsellor Survey

The careers counsellor survey was intended for current careers counsellors at Scottish secondary schools. Careers counsellors were asked about barriers they have in recommending new career paths to students, and what resources they would find helpful on Geospatial UK. This survey was sent out to current careers counsellors through Location Data Scotland, and through email via a two teachers at different schools in Edinburgh, Scotland. For the full Careers Counsellors survey, see Appendix D.

2.5 Follow-up Interviews

It was the intention of this research paper to conduct follow-up interviews with interested teachers and careers counsellors. The purpose of the follow-up interviews would be to get direct feedback on the initial version of Geospatial UK, and then again once the changes had been published. However, of the x respondents across the three relevant surveys, only two individuals indicated that they would be interested in participating in follow-up interviews. Neither of these individuals responded to scheduling attempts. As a result, follow-up interviews were not completed.

3. General Website Changes

Geospatial UK is hosted through the online platform Wix, a cloud-based web development platform which gives users the ability to design various types of websites without the need to understand Hypertext Markup Language (HTML), Cascading Style Sheets (CSS), or JavaScript. Wix was launched in 2012, and within two years had gained over 46 million users worldwide (NASDAQ, 2014). With either a free or premium paid account, editors are able to create their own websites in four different ways—adding features from the Wix feature library, and dragging them into position in the Site Editor; writing and inserting original code through the Site Editor’s Dev(eloper) Mode; integrating Wix-developed and third-party apps from the Wix store, though the majority of these require payment to fully utilise; or using Wix’s AI feature to automatically generate pages based on a text description.

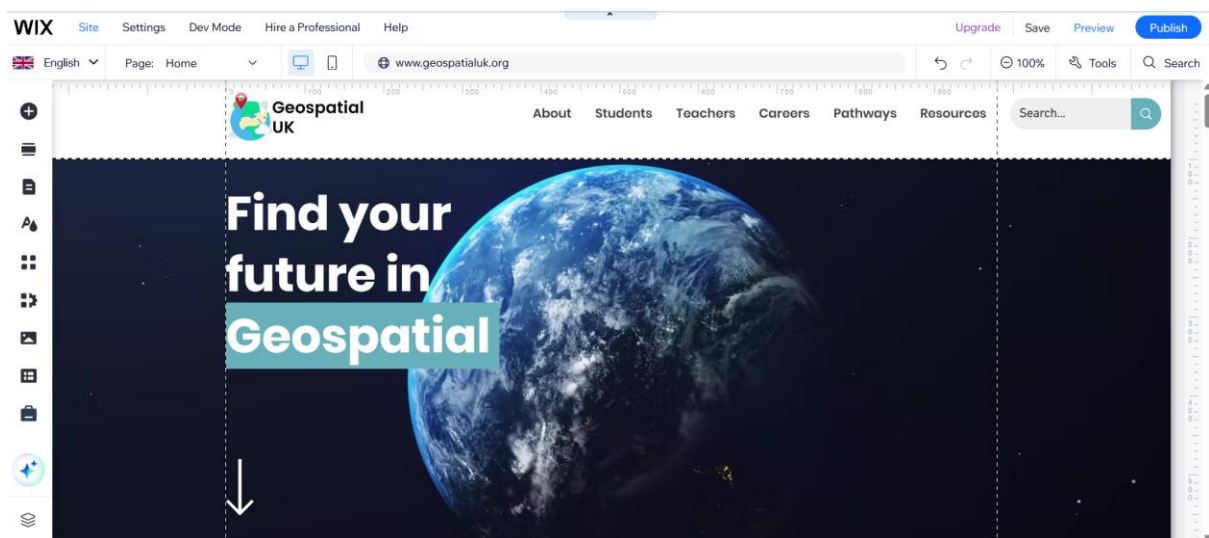


Figure 1: Site Editor for Geospatial UK.

Content can be hidden or collapsed; to do so, editors must enter Dev Mode, navigate to the specific page and section they wish to hide or collapse using the side bars, and mark the “Collapse” checkbox in the panel on the right of the screen. After exiting developer mode, sections that have been hidden or collapsed will appear with grey diagonal lines running through them. They still appear in the Site Editor, and can be un-collapsed at any point by going back to Dev Mode, but will not appear to site visitors. Editors are also provided with a dashboard that allows for web traffic analysis, SEO and payment management, management of any connected social media accounts and email communications, and more.

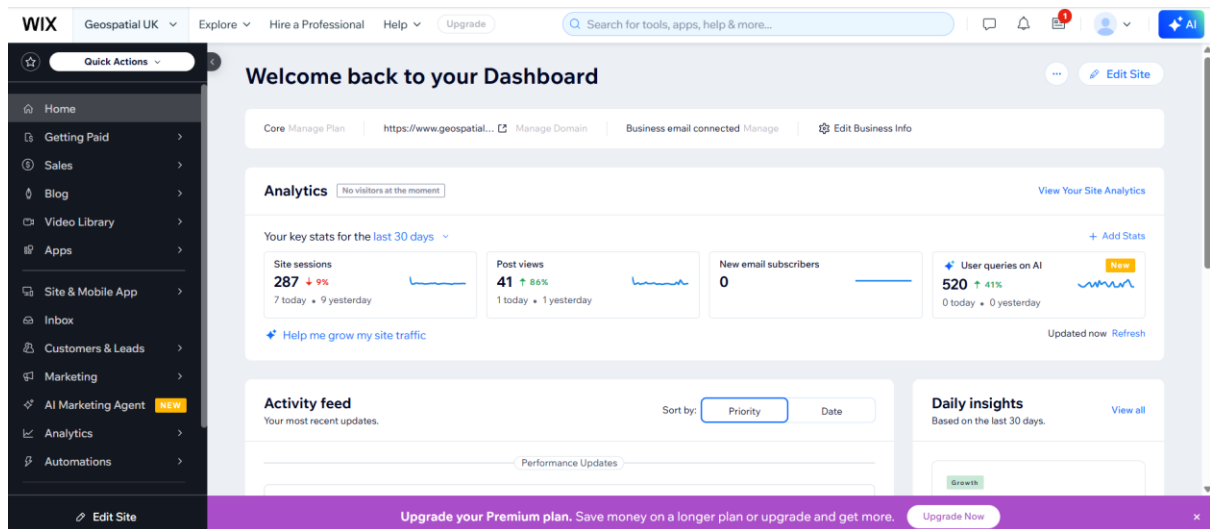


Figure 2: Wix dashboard for Geospatial UK.

There were a number of considerations and requirements for any changes made to Geospatial UK. The majority of these considerations can ultimately trace back to the unfortunate reality that there is currently no budget for ongoing maintenance and upkeep of this site. This means that additions to the website need to be self-contained and not require ongoing maintenance. Content that appears to be dynamic, but doesn't actually need to be updated, should be prioritised. It also means that changes either need to be built around free resources, meaning either free widgets or third party apps—of which there are few—or need to be coded by the developer and then integrated into the site. Additionally, resources that help to show the variety of use cases for geospatial, as well as resources with a Scottish focus, were prioritised.

3.1 Updated Information, Redundancies, and Website Flow



Figure 3: Initial website map of Geospatial UK. Sections that are repeated across multiple pages are shown in the same colour. A full-size version is available in Appendix E.

A number of small changes were made to Geospatial UK, with the first being updating information that was old or out of date. These included updated facts and figures about the geospatial industry's growth and potential, which were sourced from organizations like Location Data Scotland or reports such as the UK Geospatial Commission's 2024 Geospatial Market Sector Report; removing broken links to sponsor or job search sites; and updating the locations of current geospatial related college and university programmes. Most of these were quick fixes, accomplished by clicking into that specific site element and substituting new information or links for the old version. The locations for college and university programmes was slightly more involved; please see Section 5 regarding the web map for more details.

There were also several redundancies that were noted during the initial appraisal of Geospatial UK and subsequent site mapping. A closer look was taken at each redundancy to determine whether it could be consolidated or otherwise eliminated, or whether it was acceptable in its current form. A handful of redundancies were left as they were. For example, the bottom of each page ends with the website sponsors, links to social media, and contact information. These sections function as a footer for each

page, bringing a sense of cohesion to the website as a whole, and was left intact. Additionally, the Home page, and Student and Teacher pages, included an element designed to point users to the Resources, Careers, and Pathways pages. As these help to drive further user engagement with the site, they were also left intact.

There were a number of redundancies that were consolidated or eliminated entirely. For example, the Menu bar at the top of each page included two links back to the Home page, and placed them next to each other. Aside from the Home link, the website icon next to the Menu bar was set up to link back to the Home page as well. The icon was kept, and the additional Home link was removed. Additionally, both the Student and Teacher pages had a section for the definition of 'geospatial' and a slideshow of use cases for geospatial skills and concepts. These sections were consolidated and placed on the Home page where all site visitors would see them, not just those who visited the Student or Teacher pages.

Finally, a number of small changes were made to improve website flow. For example, the order of the pages in the Menu bar were rearranged to place Resources after Pathways, which was determined by the site administrators to be a more logical flow. A second example of this was found on the Home page, where several sections seemed to bounce between discussing the importance of geospatial, and the goals of the website.

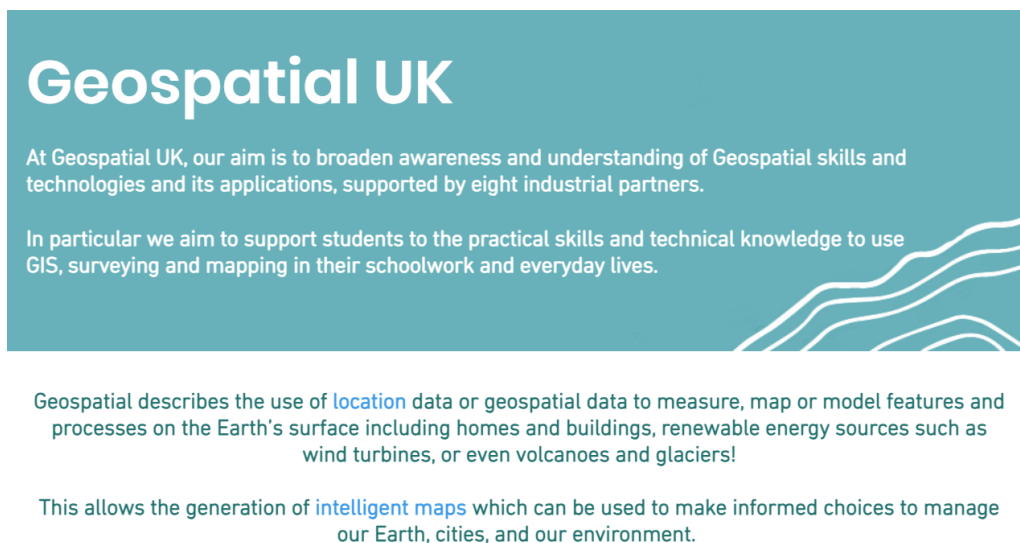


Figure 4: The Geospatial UK home page, with a section on the website goals followed by a section on the importance of geospatial.



What we do

We created this website to help students find out more about the sector, including what skills they could learn and what jobs they could get! Click on each of the categories below to find out more.

Figure 5: After finishing the section on the importance of geospatial, the Home page immediately discusses the goals of the website again.

The sections on the goals of Geospatial UK were consolidated and moved above the section on the importance of geospatial skills and concepts. This was accomplished on Wix by dragging and dropping whole sections to different areas on the same page, or copying sections to the site clipboard and then pasting them onto the new page.

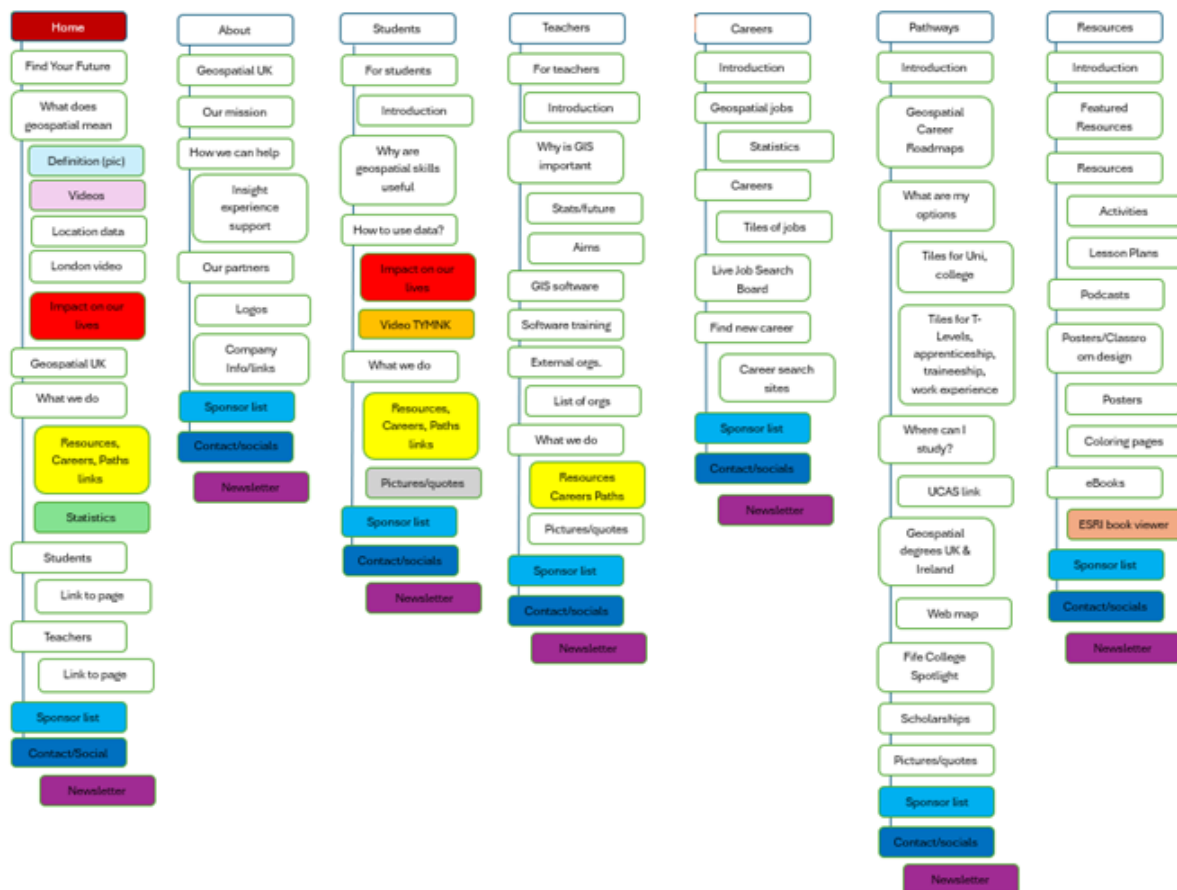


Figure 6: Geospatial UK site map after all changes made. A larger version is available in Appendix F.

3.2 Diversification of Resources and Tools

As stated, the initial version of Geospatial UK was designed with the goal of getting students interested in a career in surveying. Some of these ways were obvious, such as the careers that were chosen to be highlighted on the Career page. Of the 15 spotlighted careers, nine of them had 'Surveyor' somewhere in the title.



Figure 7: A small sample of the geospatial careers initially highlighted on the Career page.

As this did not meet the new Geospatial UK site administrator’s goals of showing students a diverse range of geospatial related careers, this section was extensively updated. Three of the previous careers – GIS Analyst, Land Surveyor, and Drone Pilot – were kept, and the remaining 12 were changed. Changing these requires each box, which “flips” when the user hovers over it to reveal a short description and salary range, to be manually updated with new text and a picture. Pictures were sourced primarily from the Wix Image Library, and salaries were averaged from Indeed UK.

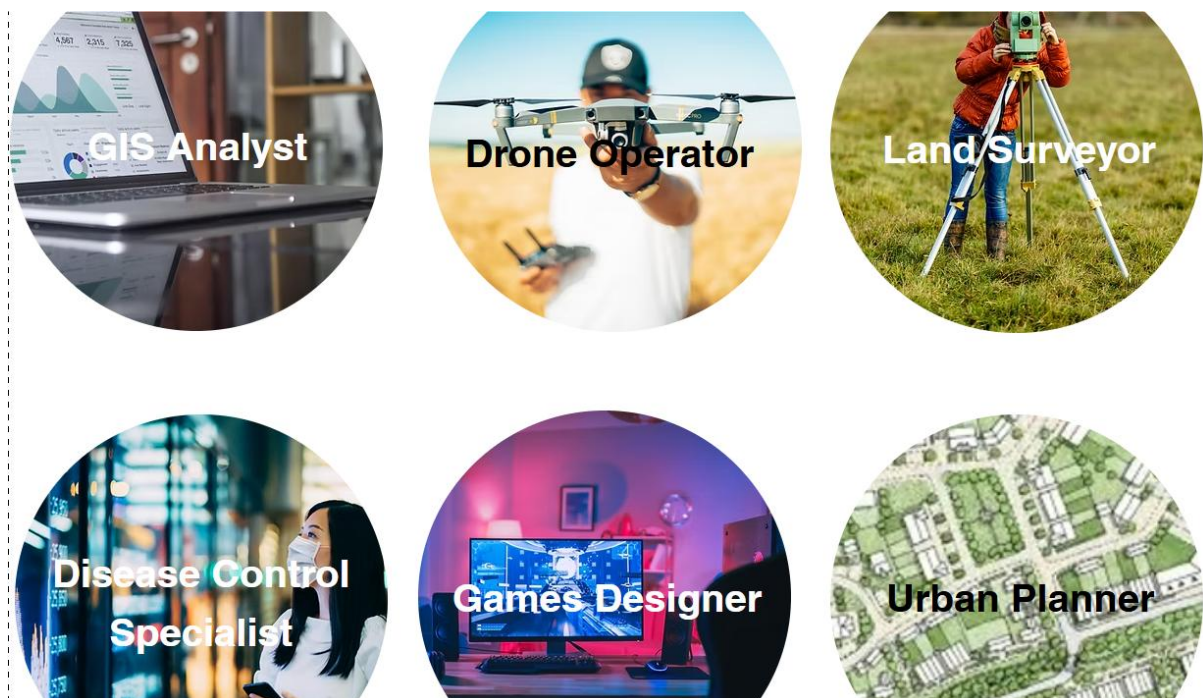


Figure 8: The updated selection of geospatial careers that are highlighted on the Careers page.

Other ways in which students were funneled to a career in surveying were less overt, though that was clearly the intention. For example, students were previously able to take a career aptitude test to determine what their ideal career would be. This test was created by the website 'Go Construct,' and did not provide any answers other than careers in construction or surveying. Several of the other links on both the Career and Pathways pages also led back to 'Go Construct.' These were either updated with more inclusive resources or removed entirely.

Additional resources were added to the Resource page. In line with the goal of reaching out to non-Geography teachers, many of these resources are overtly for Science, Maths, and Technology or Computer Science teachers. Even the resources that are listed as being more geared towards Geography also contain resources for non-Geography fields. Both the Felt webapp gallery and the ArcGIS StoryMap archives, as well as the Esri Teach with GIS resource in the 'Featured Resources' gallery, include resources that would be useful for Sociology, Business, or other subject areas that have geographical or geospatial components.

3.3 Scottish Focus

Attention was given to highlighting Scottish resources and organisations wherever possible. For example, the 'Featured Resources' gallery on the Resources page highlights two Scottish resources. Future Environmental Data Scientists is a resource that was created by University of Edinburgh graduate and researcher Dr. Sarah Donoghue; SatSchool, while currently based out of University of Leeds, has resources specifically created for the Scottish school system, and is in the process of translating their resources and lesson plans into Gallic.

The Careers page now also features a Geospatial Careers Roadmap, which has been differentiated slightly for Scottish students to accommodate the differences between their school/exam system and the system used in the rest of the UK. Users are asked to determine which school exams they will sit for, and then look at the appropriate map, in order to reduce the likelihood of encouragement of discrimination or microaggressions against the Scottish. As discrimination and microaggressions are generally based around closely held personal identities, pathological stereotypes, and power structures (Williams, 2020; Williams *et al.*, 2024), the ideal way to prevent that from occurring on Geospatial UK is to differentiate the pathway based not on national identity. Instead, it should be differentiated by school or exam system, which is less overtly tied to an individual's sense of their identity. While this cannot get rid of the risk entirely, it should significantly reduce it.

3.4 Accessibility

Accessibility refers to accommodations that are necessary for differently abled individuals to be able to fully use a website (UK Government Digital Service, 2024),

including those with visual impairments, motor difficulties, cognitive impairments or learning disabilities, and deafness or otherwise hearing impaired. Wix has several accessibility features built into the platform, including color contrast for the visually impaired. Wix has several pre-made colour palettes that editors can choose from which are accessibility friendly. Additionally, editors can choose one or two colours that fit their brand or vision, and Wix will suggest complementary colours that will maintain accessibility requirements.

However, there were some changes that needed to be made to the website in order to maintain accessibility. The biggest of these changes was to update all of the clickable buttons on the site. Previously, all of the buttons on the site said simply 'Click Here,' with little to no verbiage on what was being clicked on. For the most part, users would have to rely on context clues to know what was being clicked on, which could be difficult for the visually impaired and those who use screen readers. For this reason, all of the 'Click Here' buttons were updated to explicitly state what was being clicked on.

3.5 Mobile Version

Wix allows site creators to take into account how the mobile version of their site will look. In the standard Site Editor, editors are presented with dashed lines which represent the extent of a mobile screen. If editors place any item outside of those lines, a message will pop up on the screen which explains that something has been placed outside of the view of a mobile user, and invites the editor to change that. Any changes made will be visible to both the desktop and mobile versions of the site.

Additionally, editors are able to make changes only to the mobile version, by clicking on the mobile icon at the top of the screen and entering the Mobile Site Editor. Any changes made in this space will only affect the mobile version of the site, and can be previewed and published as normal. Mobile screens are smaller than desktops, so often layouts and large blocks of text need to be simplified, and less accurate finger-tapping, as opposed to mouse clicks, needs to be considered (Create Your Matrix, 2024; Khan *et al.*, 2023; Sung and Mayer, 2012).

Ultimately, few changes were made specifically for the mobile version of Geospatial UK. The Menu bar at the top was exchanged for a collapsible menu, in order to accommodate less accurate finger-tapping, as noted above. Additionally, some text elements needed to be moved slightly so that they were not overlapping. Otherwise the two versions remain the nearly identical, as there generally were no large blocks of text and embedded videos were already full screen width.

3.6 Improvements

A number of improvements to the site were discussed in the attached research paper, but there are two additional improvements that need to be discussed. First is to the highlighted careers on the Careers page. Additional pseudo-dynamic features can be

added to the hover boxes that contain each of the 15 highlighted careers. Users should be able to filter the highlighted jobs by different attributes, such as key adjectives describing each job or by salary. It is possible to connect a Content Reference Manager to various elements on the site, which is the first step to including a filter function. However, since this was not connected to each individual hover box when the site was first created, it would likely mean having to redo each hover box from the beginning. As the updating of the highlighted careers to be more representative of the geospatial industry was more important for the goals of the site, that took priority.

Second, there are additional improvements that can be made to the overall site accessibility. For example, several of the videos on the site are not adequately subtitled, which should be corrected. To do so would require access to equipment that was not available during this project. Should the means to undertake these improvements become available, then appropriate effort should be given to them.

4. Chatbot

Chatbots are machine agents that serve as natural language user interfaces for both service providers and data (Brandtzaeg and Folstad, 2017), simulating human conversation in order to solve questions (Sweta, 2022). In general, and briefly, chatbots use Natural Language Processing to break down users messages into individual words or phrases so that it is both easier to understand, and easier to create a response to (Teubner *et al.*, 2023). Chatbots are trained on Large Language Models, allowing them to analyse large datasets of human interactions and make predictions about human behavior. This increases the ability of the chatbot to accurately respond to inquiries and messages (Omiye *et al.*, 2024).

Designing an effective chatbot requires careful consideration of its intended purposes. The use of chatbots on websites in order to assist and engage with customers and clients has been increasing for the last several years (Mendoza *et al.*, 2022), and can be a valuable tool for increasing engagement and support (Aslam, 2023; Behera *et al.*, 2024; Whang *et al.*, 2022). Chatbots are especially useful when humans are unavailable (Joy *et al.*, 2022), as in the case of Geospatial UK. Chatbots in educational spaces are best suited for specific kinds of questions, including answering simple questions about specific topics, as well as basic reference questions (Ehrenpreis and DeLooper, 2022). For Geospatial UK, this includes questions about how geospatial relates to different subjects, where to find additional geospatial resources, and where to find jobs in the geospatial industry.

For this project, the chatbot site WotNot.io was used. This was for several reasons, mainly its no-code chatbot development process, and ability to create and use a chatbot for free. The chatbot builder allows users to drag and drop different chat functions into the building program, and connect them in the way that best suits their

use. Additionally, WotNot allows their chatbots to be created and used for free, with limited functionality. The free WotNot chatbot will respond to up to 500 messages per month based on the materials it is trained with. WotNot utilises the OpenAI platform.

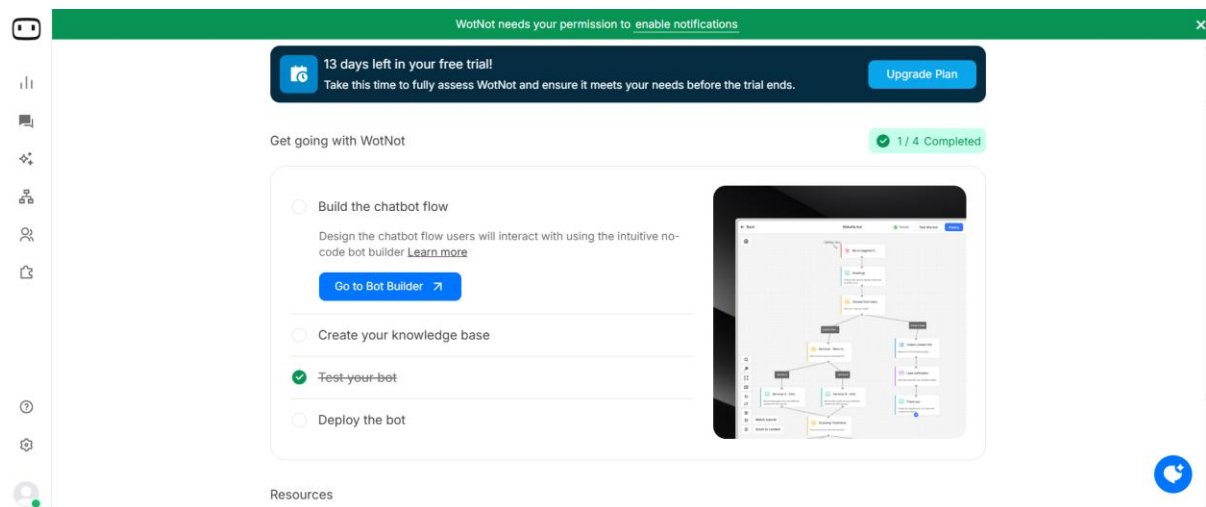


Figure 9: The WotNot main dashboard.

4.1 Creating the Chatbot through the Bot Builder Function

WotNot guides its users through the four stages of building their chatbots: Building the chatbot flow, creating the knowledge base the chatbot will work from, testing the bot, and deploying it.

The first step is to build the chatbot flow. Users are directed to go to Bot Builder, and select whether they want to create an inbound or outbound chatbot. As the Geospatial UK chatbot is for answering visitor questions, an inbound chatbot needs to be created. Inside the Bot Builder function, users need to determine what types of input and responses they want at each stage. From the Bot Trigger, a Greeting (text-based message) is automatically selected. A Menu was created, which gives visitors options to choose from regarding what they want to know or do on the site.

Three separate text-based responses were loaded: Teaching Resources, Careers, and Pathways. These were chosen based on previous site analytics, which showed that these were the most visited pages on Geospatial UK. The chatbot, named Gaia, has pre-written responses to questions about where to find teaching resources, where to look for geospatial careers, and how to find information on entering the geospatial industry. Additionally, the Teaching Resources flow will ask if the user has found what they are looking for; if they answer no, Gaia will suggest additional search terms for a traditional internet search.

Additionally, two AI Answer responses were also loaded—one for asking about geospatial in general, and the other for asking about the geospatial industry in the UK. These AI Answer responses will answer extremely basic questions about these topics. Questions need to be nearly identical to what is listed in the training packet, and

generally need to reference the UK in the question; otherwise, the chatbot will struggle to answer them. These AI Answer flows need to be connected to the specific knowledge base before they will draw upon the stored information. To do this, select the correct knowledge base from the drop-down menu in each box in the flow.



Figure 10: The chatbot flow for the Geospatial UK chatbot.

4.2 Training Materials

The second step in building the chatbot is to create a Knowledge Base. A number of different training materials were sourced or developed for this chatbot. WotNot allows its chatbots to be trained on websites, documents, and images, and sets the cap at 2000. While this does seem like a lot, entering a website into the training mechanism will also add all of the pages linked off of that URL. For example, training the chatbot on the Location Data Scotland website took up 323/2000 slots, so websites need to be chosen with care. Websites were chosen for their up-to-date information on the geospatial industry, and include UK government reports and Location Data Scotland. Several documents were created, which include a list of potential questions for the chatbot and their accompanying answers. Images include the Geospatial Career Road Map, which is also located on the Pathways page of Geospatial UK, and an image of nearly 40 careers which use location data or geospatial skills. For the full training document packet, see Appendix G.

Additional training documents can be added to the Knowledge Base at any time, through the “Add Data Source” button on the landing page for that specific Knowledge Base. At that point, the chatbot will need to be retrained before the new information will be used in responses.

4.3 Process for Training and Testing Chatbot

The process for training a chatbot through WotNot is simple. After adding files or URLs to the Knowledge Base, click the “Train” button. Documents and URLs that the chatbot has been successfully trained on will show in the table. The table shows the data source, type of data source, status, and when/by whom it was added.

< Back

Geospatial UK

Data sources: 346 / 2,000 • Last updated on : Aug 3, 2025

▶ Preview [+ Add data source](#)

🔍 Search Filter Domain(s)

346 results

☐ Data source	Type	Status	Added at ▼	Added by	Refresh
☐ Alternate roadmap.docx	📄 File	Trained	2h ago	Jessica Zenger (You)	Never
☐ UK roadmap.docx	📄 File	Trained	2h ago	Jessica Zenger (You)	Never
☐ Scotland roadmap.docx	📄 File	Trained	2h ago	Jessica Zenger (You)	Never

Rows: 1000 ▼ 1-346 of 346 |< < > >|

Figure 11: Table of training documents for Geospatial UK's Gaia chatbot.

Testing the chatbot can be done in two different ways. From the home page, users can click on “Test Your Bot.” The bot can also be tested by going into the Bot Builder, and testing from there. There are two options from this page – either testing the bot from the very top of the chatflow, or testing specific branches of the chatflow. In either case, users are able to follow either the pre-written questions and answers, or engage with the AI Answer function. Additional changes can be made after the testing process.

4.4 Chatbot Dashboard

WotNot users are provided with an analytics dashboard, which can be accessed through the Analytics icon on the left-side menu of the Home screen. Here, users can find analytics reports in four different submenus. The first is “Chatbot,” which provides information about the number of visitors and conversations, average length of conversations, and more.

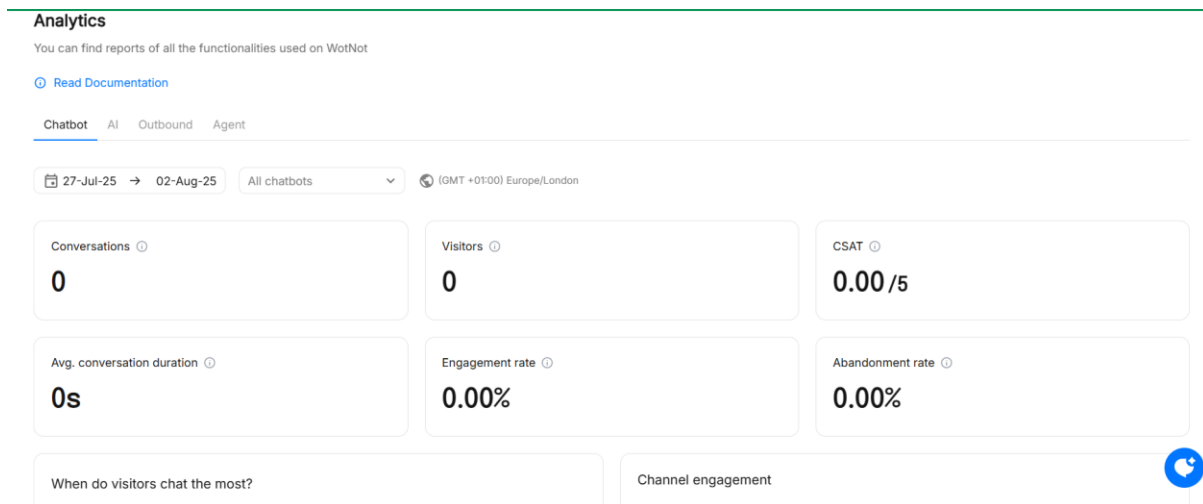


Figure 12: Chatbot submenu for Analytics dashboard.

The second submenu is for the AI Answer chats. This dashboard tracks how satisfied users are with the answers they receive, tracks the average number of messages in each chat, and analyses questions for consumer trends. Topics for Geospatial, Geospatial Industry, and Remote Sensing were added. All other topics will be categorised as “Other.” Dashboard administrators can see what is being categorised as “Other,” and can update the topics that the chatbot will pay attention to.

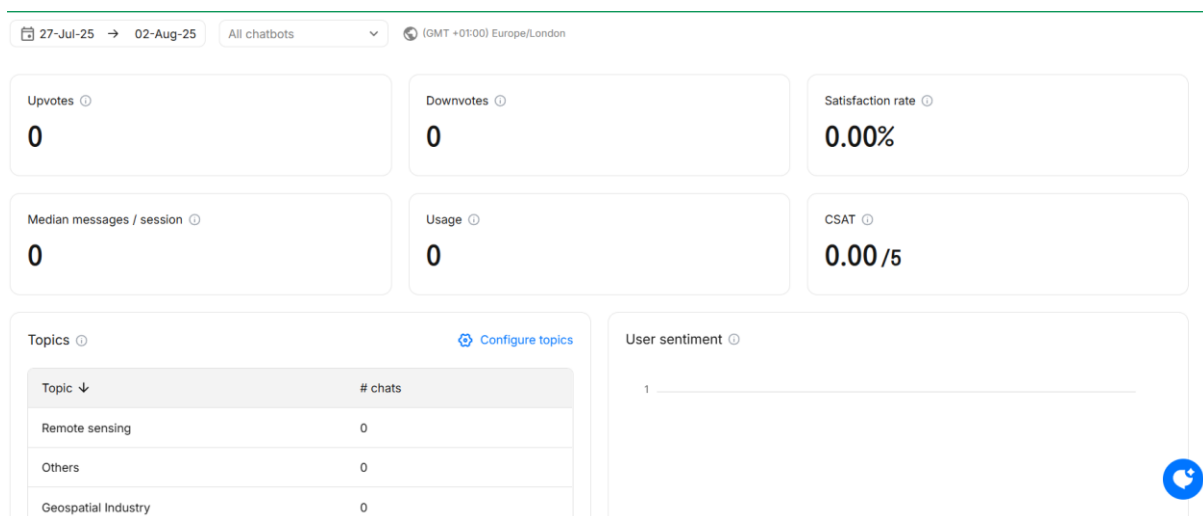


Figure 13: AI submenu of the Analytics dashboard.

The third and fourth submenus of the Analytics dashboard are “Outbound” and “Agent.” These dashboards are blank, as these functions were not used when building the Geospatial UK chatbot.

4.5 Integration with Geospatial UK

Integration of the chatbot with Geospatial UK is a two-step process. The first step is to deploy the chatbot on the WotNot website. From the main screen, enter the Bot Builder, and then select the blue ‘Deploy’ button in the upper right-hand corner. Enter the

domain name of the website where the chatbot will be deployed and save, and then copy the HTML snippet provided.

Web channel configuration

Add the code snippet mentioned below on your website to add the chatbot on your website.

Website URL

https://www.geospatialuk.org

Copy the code snippet below, and paste it before the <body> tag on every page of your website

<script src="https://app.wotnot.io/chat-widget/57bHsDgYaYse111923384459XEA8XUUH.js" defer></script>

Cancel

Deploy

Figure 14: The provided HTML snippet for the Geospatial UK chatbot.

The second step is to return to the Wix Dashboard (not the Site Editor). In the menu on the left side, click 'Settings,' and then 'Custom Code.' In the section titled Head, paste the HTML snippet that was provided. Choose whether you want the chatbot to be on every page, or a single page. For Geospatial UK, the decision was made to have the chatbot only on the home page. Make sure that the chatbot is turned on, both on WotNot and in Wix. To check that the chatbot is available, go back to the Dashboard, and at the top click on the circle with the ellipses inside, next to 'Edit Site' in the upper right hand corner. From there, click 'View Live Site.' The chatbot icon will show at the bottom of the screen. For visual clarity, a contrasting colour in line with the rest of the site was chosen for the color of the chatbot bubble.

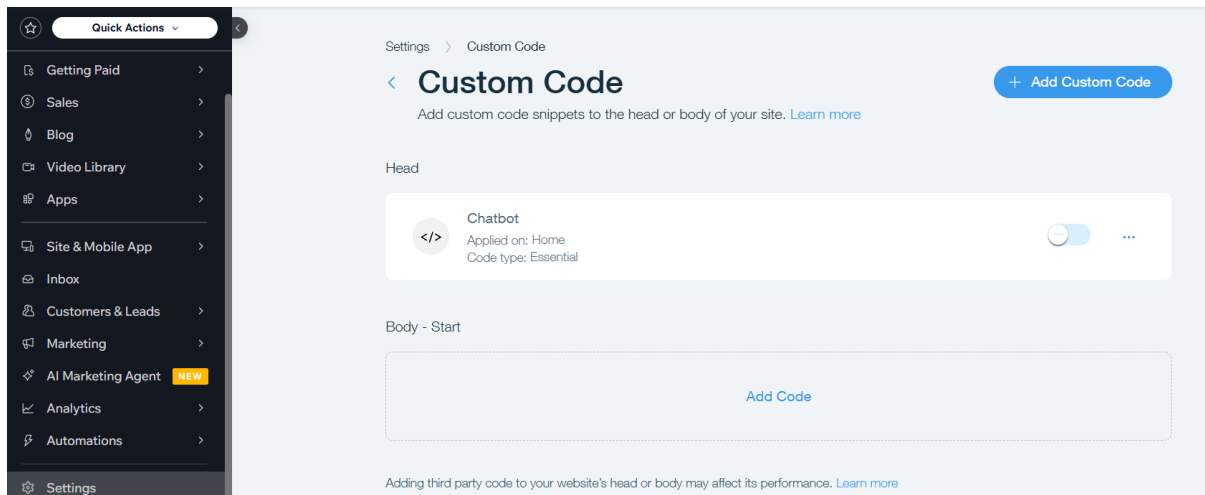


Figure 15: Embedding the chatbot code snippet into the header through the Wix Dashboard.

4.6 Improvements

There are several improvements that could be made to the Geospatial UK chatbot. In its current form, the Geospatial UK chatbot will only answer a limited number of questions related to the geospatial industry, what geospatial means, and where to go on Geospatial UK site in order to find resources, careers and job search information, and information on pathways into the industry. There is most likely additional information that could be added to the chatbot. The choices of what information to include at this stage was based on site analytics, specifically for which pages people visited the most. However, once the chatbot has been deployed for a length of time, the WotNot Analytics Dashboard can determine what types of questions people are asking the most; these are the questions and training information that should be added at a later stage.

Furthermore, the questions that the chatbot can answer do need to be worded very specifically. Questions about the geospatial industry need to ask about the UK in particular, or else the chatbot may not know the answer. It also helps if the questions that the chatbot is being asked are very similar or nearly identical to the way that the questions are posed in the training materials. With some effort, the chatbot could be updated to allow for a wider variety of questions which are ultimately trying to get at the same topic and answer.

Last, there are additional features available through WotNot, but only for those who are paying for a monthly subscription. Currently, paid subscriptions are able to access multiple AI platforms as a basis for AI Answers, higher numbers of chats that it can respond to each month, integration with various widgets and apps, live chat options, and more. Though some of these features would be nice to have, it should not be considered an essential upgrade.

5. Web Map

Web maps are interactive, web-based technologies that allow users to visualise and explore maps on a variety of information with a geographic component (Rees *et al.*, 2023). In the Geospatial UK context, site visitors will be presented with a web map showing the locations of colleges and universities across the UK with educational programmes that have a geospatial context. The initial version of the site used a third-party application to store this data and produce a map with the locations on it. However, this application was not free; as the previous payment method was removed and the new site administrators do not have a budget for ongoing site maintenance, this application now only shows three locations across the UK. Since there are more than three geospatial-related educational programmes in the UK, this presents a problem. A new web map was coded and then added to Geospatial UK through Dev Mode.

5.1 Web Map Creation

The first step to creating the new web map for Geospatial UK was to gather a list of all of the college and university programmes that have geospatial courses or elements. The final list was sourced from three main places: the existing web map on Geospatial UK, a list created Tom Janes in his 2023 MSc dissertation, and from internet searches. The web map on Geospatial UK had not been updated since 2022; considerable time was spent checking that these programs were all still running. The second list was more extensive, as it did not just include programmes that were centered around surveying; however, this list was also two years old and needed to be checked for accuracy. Finally, internet searches and UCAS were utilised to find other programs that had either been previously overlooked or were new. University logos were sourced from the university in question, where possible—most universities have a branding kit available for use. Where this was unavailable, a Google image search was used. Any backgrounds behind the logo were removed using the Wix Image Editor, and images were cropped. Latitude and longitude coordinates were sourced from Google Earth. For a full list of the universities and courses marked on the map, see Appendix H.

A new web map was created for Geospatial UK using Leaflet, a JavaScript library for interactive maps. The web map itself utilises HTML, CSS, and Javascript. HTML is used to set the structure of the page and the map itself. It sets the headings and dividers between the sections, imports the CSS package for Leaflet, and closes all of the headings and dividers at the end of the map.

```

1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4      <!-- set character coding and viewport -->
5      <meta charset="UTF-8">
6      <title>University Locations Map</title>
7      <meta name="viewport" content="width=device-width, initial-scale=1.0">
8      <!-- import Leaflet CSS -->
9      <link rel="stylesheet" href="https://unpkg.com/leaflet/dist/leaflet.css" />
10     <!-- import Roboto font -->
11     <link href="https://fonts.googleapis.com/css2?family=Roboto:wght@400&display=swap" rel="stylesheet">
12     <!-- set CSS style for map and sidebar -->
13     <style>
14         /* set map and sidebar next to each other */
15         body { margin: 0; display: flex; }
16         /* set size of map, set map at 75% of viewport */
17         #map { height: 100vh; flex: 75%; }
18         /* set sidebar at 25% of viewport, enable scrolling for overflow, use Roboto font */
19         #sidebar { flex: 25%; overflow-y: auto; height: 100vh; padding: 10px; font-family: 'Roboto', sans-serif }
20         /* set styles for images in sidebar */
21         #sidebar img { width: 50px; height: auto; float: left; margin-right: 10px; }
22         #sidebar div { margin-bottom: 20px; }
23     </style>
24 </head>
25 <body>
26
27 <div id="map"></div>
28 <div id="sidebar"></div>

```

Figure 16: A small snippet of beginning HTML and CSS code.

CSS is a style sheet language that is used to set the style and presentation of documents that use HTML and other markup languages. Here, CSS was used in lines 15-22 to set the way that the map and sidebar look, including fonts and sizes, and how they interact with each other, such as the screen split between the map and the sidebar.

JavaScript, and the Leaflet library in particular, was used to encode the map locations and set how the map markers and sidebar entries function, both independently and related to each other. JavaScript was used to create the ‘universities’ variable, and then format the information for each university individually in its own function.

```

32  // create university variable with name, website, programs, lat/lng coordinates, and logo for each one
33  var universities = [
34      {
35          name: "University of Edinburgh",
36          website: "https://www.ed.ac.uk",
37          programs: [
38              "MSc Geographical Information Science",
39              "MSc Earth Observation and Geoinformation Management"
40          ],
41          lat: 55.94522, lng: -3.18803,
42          logo: "https://static.wixstatic.com/media/4883c1_f7ce9dda705640c8bd5a2b588e211948-mv2.png"
43      },

```

Figure 17: Example formatting for University of Edinburgh. All schools were formatted in the same manner.

Once all of the universities were listed and the information properly formatted, JavaScript was used to initialise the map and have it show on the screen.

```

483  // initialize map, set initial view to following coordinates with zoom level 6
484  var map = L.map('map').setView([54.559322, -3.912204], 6);
485
486  // uses OpenStreetMaps for map background, sets max zoom level to 18
487  L.tileLayer('https://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png', {
488      maxZoom: 18,
489      attribution: 'Map data &copy; <a href="https://www.openstreetmap.org/copyright">OpenStreetMap</a> contributors'
490  }).addTo(map);

```

Figure 18: JavaScript code to initialise map.

Finally, JavaScript was used to build a function that iterates through each university that has been listed, in order to put a marker on the map at their location. The pop-up for

each university is connected to the university's sidebar listing, and formats each with their name, logo, course offerings, and link to the university's website. A function was also created that zooms in to a particular university when their sidebar entry is clicked by the user.

```

492 // iterates over each university to place marker on map
493 // binds popup to marker showing each university's name, programs, and website link
494 universities.forEach(function(university) {
495     var marker = L.marker([university.lat, university.lng]).addTo(map);
496     marker.bindPopup("<b>" + university.name + "</b><br><ul><li>" +
497         university.programs.join("</li><li>") +
498         "</li></ul><a href='" + university.website + "' target='_blank'>Website</a>");
499
500     // creates entries in sidebar for each university with their logo, name, programs, and website; makes each entry clickable
501     var sidebarEntry = "<div onclick='zoomTo(" + university.lat + "," + university.lng + ")'>" +
502         "<img src='" + university.logo + "'><strong>" + university.name + "</strong><ul><li>" +
503         university.programs.join("</li><li>") +
504         "</li></ul><a href='" + university.website + "' target='_blank'>Website</a></div>";
505
506     document.getElementById('sidebar').innerHTML += sidebarEntry;
507 });
508
509 // moves the map to a specific university when the sidebar entry is clicked
510 window.zoomTo = function(lat, lng) {
511     map.setView([lat, lng], 13);
512 };
513 </script>

```

Figure 19: JavaScript code for iterating through universities, creating pop-ups and sidebar entries and binding them together, and adding the click-zoom feature.

For the full web map code, see Appendix I.

5.2 Integration with Geospatial UK

Integration of the new Leaflet web map with Geospatial UK proved to be a simple process. From the Wix Site Editor, click into the section that the code needs to be added to in order to highlight it, and then click the plus 'Add Element' icon on the left-hand side. From there, click on 'Embed Code,' then 'Popular Embeds,' and finally 'Embed HTML.' Wix will open a pop-up window. Add the custom HTML code into the box provided, add an alternate caption in order to maintain accessibility, and click the blue 'Update' button. Upon returning to the main page, there will be a small viewer added to your section, in which the results of your code will be visible. Enlarge the viewer to the required size. For Geospatial UK, the viewer was enlarged to fill the entire area between the mobile viewer lines. Check that the code works as intended in 'Preview.'

The previous web map was not fully removed from Geospatial UK, but simply hidden through Dev mode. This was done so that the site administrators could return to this version of the map at any point, though the locations would need to be updated. It can be deleted at any time by right-clicking into that particular section, and then clicking 'Delete.'

5.3 Improvements

There are several improvements that could be undertaken to the updated web map. First, as available geospatial educational programmes and courses can change on a yearly basis, it could be beneficial to find a way to have the map update itself on an annual basis. This is likely to become more important as the number of geospatial

programmes increases, as it is a significant time investment to check to see what available programmes there are across the UK. As Geospatial UK does not currently have an individual identified to maintain the site and all its components, this would be extremely beneficial.

There are also other web map making programs that could be used to build the web map. For example, Mapbox is a popular web map building program that could be utilised instead of Leaflet. Mapbox allows for easy customization, so that the web map could be more easily matched to the styles and colours already in use on Geospatial UK. Using the Mapbox API would also allow for use of a feature where users can explore the surrounding area of a specific point in 3D. This could be useful for those who also consider the city and surrounding environment when choosing where to attend college or university. Though there are free tiers for Mapbox, the use of any Mapbox tier does require a credit card to be entered, as users are charged monthly for the number of views that their map gets.

6. Publishing Changes

Publishing changes to a Wix site is simple. Once changes have been made in the Site Editor, click the 'Save' button at the top of the screen. A pop-up will appear, inviting the editor to publish the changes. The editor can either publish the changes, or close the pop-up without publishing. Once changes are saved, the new version of the site is saved in Version Control. This allows editors to easily publish different versions of the site without having to spend time making all the changes once again (for example, this would be useful for a retail site with a seasonal promotion. Once the promotion ended, the site editor could simply revert back to the latest version of the site that didn't include the promotion, without having to change or remove every single mention of it across the entire site). The Wix Site Editor also allows changes to be previewed before being published, though this function tends to be slow.

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Appendix A: Student Survey Questions

Geospatial Student Survey

Help Shape the Future of Geospatial in Scotland

"Geospatial" refers to information that is related to specific locations on Earth. Geospatial skills involve mapping objects, events, or other real-world phenomena to their specific geographical location.

Scotland's geospatial sector is evolving rapidly, with projections valuing it at over £9 billion by 2027, and Scotland is positioning itself as the next global leader in the geospatial industry. Yet, despite this growth, the sector faces significant challenges: 70% of organisations report skills-related difficulties with their current employees, over half struggle to recruit, and 81% find it hard to retain talent.

To help address these challenges, Location Data Scotland (LDS), in collaboration with the University of Edinburgh and AGI Scotland, is leading a national initiative to raise awareness of geospatial career pathways and improve access to relevant skills training. As part of this work, we have partnered with Fife College to launch the Geospatial Foundation Skills Programme—an innovative, accessible starting point designed to inspire new entrants into the sector, particularly through schools, colleges, and career advisors.

This survey is part of that wider effort to understand how we can better equip students with the knowledge and tools to pursue a career in the geospatial industry. It also forms part of my MSc Dissertation, and is intended to provide information on helpful features for a website dedicated to promoting geospatial careers to students. All answers will be anonymous, and data will be stored, accessed, and analysed on secure university servers in accordance with academic research protocols.

We want to hear from you. Your responses will inform the ongoing development of resources, courses, and outreach initiatives to ensure Scotland builds a future-ready geospatial workforce.

The survey should take approximately 10 minutes.

Section 1

...

Initial Exposure to Geospatial

1. How did you first hear about the geospatial industry? Select all that apply. If marking 'Other,' please explain.

- ☐ A class or school project
- ☐ A teacher or professor
- ☐ A career fair or industry event
- ☐ A friend or family member
- ☐ Social media or online content
- ☐ Internship or job experience
- ☐ Other

2. At what stage in your education did you first become interested in geospatial topics?

- ☐ Primary/elementary school (ages 5-10)
- ☐ Middle school years (ages 11-13)
- ☐ High school/secondary school (ages 14-18)
- ☐ Early college/university
- ☐ Late college/university

Motivations and Influences

3. What initially sparked your interest in geospatial technologies? Select up to 3. If marking 'Other,' please explain.

Please select at most 3 options.

- ☐ Interest in maps or cartography
- ☐ Interest in data analysis or programming
- ☐ Environmental or sustainability concerns
- ☐ Urban planning or infrastructure
- ☐ Curiosity about satellites or drones
- ☐ Desire to solve real-world problems
- ☐ Other

4. Who or what had the biggest influence on your interest in geospatial/GIS?

Enter your answer

5. On a scale of 1-5, where 1 is Not at all Important and 5 is Very Important, please rate the following in terms of the development of your interest in geospatial topics:

	Not at all Important	2	3	4	5 - Very Important
Classroom learning	☐	☐	☐	☐	☐
Hands-on projects	☐	☐	☐	☐	☐
Internships or work experience	☐	☐	☐	☐	☐
Mentorship or role models	☐	☐	☐	☐	☐
Media (TV, YouTube, podcasts, etc.)	☐	☐	☐	☐	☐
Academic research or articles	☐	☐	☐	☐	☐
Outdoor activities (eg. hiking, swimming, orienteering, cycling, etc.)	☐	☐	☐	☐	☐

Challenges and Barriers

6. What challenges, if any, did you encounter when you were first learning about the geospatial industry/technologies?

Enter your answer

7. On a scale of 1-5, with 1 being Very Unhelpful and 5 being Very Helpful, please rate the following in terms of information you had/would liked to have had when first learning about geospatial skills and careers:

	1 - Very Unhelpful	2	3	4	5 - Very
General education or careers pathways	☐	☐	☐	☐	☐
Information about specific careers	☐	☐	☐	☐	☐
Information about specific salaries	☐	☐	☐	☐	☐
Information about how my skills and interests align with the industry	☐	☐	☐	☐	☐
Information about how my skills and interests can help solve real-world problems	☐	☐	☐	☐	☐
A clear definition of 'geospatial'	☐	☐	☐	☐	☐
Spotlights on current professionals	☐	☐	☐	☐	☐

8. If there is other information that would have been helpful, but wasn't listed above, please explain and provide a rating.

Enter your answer

9. On a scale of 1-5, where 1 is Very Unhelpful and 5 is Very Helpful, please rate the following in terms of activities/things you had/would liked to have had when first learning about geospatial skills and careers.

	1 - Very Unhelpful	2	3	4	5 - Very
Podcasts	☐	☐	☐	☐	☐
Interactive games or activities with geospatial skills or topics	☐	☐	☐	☐	☐
Webapps	☐	☐	☐	☐	☐
Contests, competitions, or Hackathons	☐	☐	☐	☐	☐
Access to relevant computer programs or software	☐	☐	☐	☐	☐
Case studies	☐	☐	☐	☐	☐

...

10. If there is something else that would have been helpful but wasn't listed above, please explain and provide a rating.

Enter your answer

Section 4

...

Final Comments

Thank you very much for your participation!

11. Do you have any other comments or suggestions about how best to support young students as they explore geospatial skills and careers?

Enter your answer

Appendix B: Geography Teacher Survey

Geospatial Skills Geography Educator Survey

Help Shape the Future of Geospatial Careers in Scotland

"Geospatial" refers to information that is related to specific locations on Earth. Geospatial skills involve mapping objects, events, or other real-world phenomena to their specific geographical location.

Scotland's geospatial sector is evolving rapidly, with projections valuing it at over £9 billion by 2027, and Scotland is positioning itself as the next global leader in the geospatial industry. Yet, despite this growth, the sector faces significant challenges: 70% of organisations report skills-related difficulties with their current employees, over half struggle to recruit, and 81% find it hard to retain talent.

To help address these challenges, Location Data Scotland (LDS), in collaboration with the University of Edinburgh and AGI Scotland, is leading a national initiative to raise awareness of geospatial career pathways and improve access to relevant skills training. As part of this work, we have partnered with Fife College to launch the Geospatial Foundation Skills Programme—an innovative, accessible starting point designed to inspire new entrants into the sector, particularly through schools, colleges, and career advisors.

This survey is part of that wider effort to understand how we can better equip those in advisory roles — such as careers advisors, employability practitioners, and educators — with the knowledge and tools to support the next generation of geospatial professionals. It also forms part of my MSc Dissertation, and is intended to provide information on helpful features for a website dedicated to promoting geospatial careers to students. All answers will be anonymous, and data will be stored, accessed, and analysed on secure university servers in accordance with academic research protocols.

We want to hear from you. Your responses will inform the ongoing development of resources, courses, and outreach initiatives to ensure Scotland builds a future-ready geospatial workforce.

The survey should take no longer than 5-10 minutes.

Section 1

...

Understanding Your Perspective on Geospatial Skills

1. How well do you agree with the following statement?

Using geospatial skills (e.g. creating and interpreting maps, understanding of spatial relationships, etc.) can add value to my classroom.

*

- ☐ Agree
- ☐ Somewhat Agree
- ☐ Neutral
- ☐ Somewhat Disagree
- ☐ Disagree
- ☐ Don't Know

...

2. If you selected 'Disagree' or 'Don't Know,' please briefly explain the reason(s).

Enter your answer

Designing a Supportive Geospatial Skills Website

3. What features would you find helpful on an educational website regarding using geospatial skills in the classroom? *

- ☐ Teaching resources
- ☐ Resource training guides
- ☐ Continuing education options
- ☐ eBooks about geospatial applications
- ☐ Regular newsletter about updates in geospatial skills for education
- ☐ Link to an ambassador programme
- ☐ Classroom posters
- ☐ Other

4. What types of teaching resources would you find most helpful for incorporating geospatial skills into your classroom? Please choose your top 5 responses. *

Please select at most 5 options.

- ☐ Full lesson plans (30-60 minutes)
- ☐ Interactive webapps
- ☐ Videos
- ☐ Student friendly tutorials
- ☐ Project ideas
- ☐ Assessment tools
- ☐ Case studies or real-world examples
- ☐ Podcasts
- ☐ Forums or teacher community space
- ☐ Curriculum Es&Os/benchmark referencing

☐ Other

5. How could an educational website support student engagement with mapping skills? *

Enter your answer

Understanding Desired Student Outcomes

6. What topics would you like to use geospatial tools for? *

Enter your answer

7. Please rank the following student outcomes from Most Important to Least Important. *

Critical Thinking

Problem Solving

Organization skills

Collaboration skills

Engagement with real-world issues

Technology skills

Student-driven learning and assessment

...

8. Please rank the following *geospatial skills* student learning outcomes, from Most Important to Least Important.

Visualising geographic data as maps or story maps

Analysing and interpreting maps

Understanding spatial relationships and patterns

Using geospatial tools and technologies

Collecting spatial data

Applying geospatial thinking (relationships and patterns) to real-world issues

9. What other student outcomes would you expect or want to see from incorporating geospatial skills and tools into the classroom? *

Enter your answer

Working With Other Educators

10. What are your thoughts on creating opportunities to collaborate with non-Geography teachers on teaching geospatial skills? *

Enter your answer

Final Comments and Follow-Up

11. Do you have any other comments or suggestions to support this work?

Enter your answer

12. If you would be interested in a short follow-up interview or conversation, please leave your name and email address below:

Enter your answer

Thank You!

Thank you for taking the time to complete this survey. Your insights are greatly appreciated and will play a key role in helping shape geospatial careers resources for students and advisors across Scotland.

If you've opted in for follow-up contact, we will be in touch soon. Otherwise, thank you again for your valuable contribution to this important work!

Appendix C: Non-Geography Teacher Survey

Geospatial Skills Educator Survey

Help Shape the Future of Geospatial Careers in Scotland

"Geospatial" refers to information that is related to specific locations on Earth. Geospatial skills involve mapping objects, events, or other real-world phenomena to their specific geographical location.

Scotland's geospatial sector is evolving rapidly, with projections valuing it at over £9 billion by 2027, and Scotland is positioning itself as the next global leader in the geospatial industry. Yet, despite this growth, the sector faces significant challenges: 70% of organisations report skills-related difficulties with their current employees, over half struggle to recruit, and 81% find it hard to retain talent.

To help address these challenges, Location Data Scotland (LDS), in collaboration with the University of Edinburgh and AGI Scotland, is leading a national initiative to raise awareness of geospatial career pathways and improve access to relevant skills training. As part of this work, we have partnered with Fife College to launch the Geospatial Foundation Skills Programme—an innovative, accessible starting point designed to inspire new entrants into the sector, particularly through schools, colleges, and career advisors.

This survey is part of that wider effort to understand how we can better equip those in advisory roles — such as careers advisors, employability practitioners, and educators — with the knowledge and tools to support the next generation of geospatial professionals. It also forms part of my MSc Dissertation, and is intended to provide information on helpful features for a website dedicated to promoting geospatial careers to students. All answers will be anonymous, and data will be stored, accessed, and analysed on secure university servers in accordance with academic research protocols.

We want to hear from you. Your responses will inform the ongoing development of resources, courses, and outreach initiatives to ensure Scotland builds a future-ready geospatial workforce.

The survey should take no longer than 5-10 minutes.

Section 1

...

Understanding Your Perspective on Geospatial Skills

1. What subject do you teach? *

- ☐ History
- ☐ Biology
- ☐ Geology/Earth science
- ☐ Physics
- ☐ Chemistry
- ☐ Art/Design
- ☐ Maths
- ☐ Physical Education/sports
- ☐ Health/well-being
- ☐ English language/literature
- ☐ Technology
- ☐ Modern Studies
- ☐ Business studies/Enterprise
- ☐ Computing/ICT
- ☐ Other

2. How well do you agree with the following statement:

Using geospatial skills (e.g. creating and interpreting maps, understanding of spatial relationships, etc.) can add value to my classroom.

*

- ☐ Agree
- ☐ Somewhat Agree
- ☐ Neutral
- ☐ Somewhat Disagree
- ☐ Disagree
- ☐ Don't Know

3. If you selected 'Disagree' or 'Don't Know,' please briefly explain the reason(s):

Enter your answer

Section 2

...

Designing a Supportive Geospatial Skills Website

4. What features would you find helpful on an educational website regarding using geospatial skills in the classroom? *

- ☐ Teaching Resources
- ☐ Resource training guides
- ☐ Continuing education options
- ☐ eBooks about geospatial applications
- ☐ Regular newsletter about updates in geospatial skills for education
- ☐ Link to an ambassador programme
- ☐ Classroom posters
- ☐ Other

5. What types of teaching resources would you find helpful for incorporating geospatial skills into your classroom? Please choose your top 5 responses. *

Please select at most 5 options.

- ☐ Full lesson plans (30-60 minutes)
- ☐ Interactive webapps
- ☐ Videos
- ☐ Student friendly tutorials
- ☐ Project ideas
- ☐ Assessment tools
- ☐ Case studies or real-world examples
- ☐ Podcasts
- ☐ Forums or teacher community space
- ☐ Curriculum Es&Os or benchmark referencing

☐ Other

6. How could an educational website support student engagement with mapping skills? *

Enter your answer

Section 3

...

Understanding Desired Student Outcomes

7. What topics would you like to use geospatial tools with? *

Enter your answer

8. Rank the following student outcomes from Most Important to Least Important *

Critical thinking

Problem Solving

Organization skills

Collaboration skills

Engagement with real-world issues

Technology skills

Student-driven learning and assessment

9. Please rank the following *geospatial skills* student learning outcomes, from Most Important to Least Important. *

Visualising geographic data as maps or story maps

Analysing and interpreting maps

Understanding spatial relationships and patterns

Using geospatial technologies and tools

Collecting spatial data

Applying geospatial thinking (relationships and patterns) to real-world issues

10. What other student outcomes would you expect or want to see from incorporating geospatial tools into the classroom?

Enter your answer

Section 4

Working with Other Educators

11. What are your thoughts on taking advantage of opportunities to collaborate with Geography teachers on teaching geospatial skills?

Enter your answer

Section 5

Final Comments and Follow-Up

12. Do you have any other comments or suggestions to support this work?

Enter your answer

13. If you would be interested in participating in a short follow-up interview or conversation, please leave your name and email address below:

Enter your answer

Section 6

Thank You!

Thank you for taking the time to complete this survey. Your insights are greatly appreciated and will play a key role in helping shape geospatial careers resources for students and advisors across Scotland.

If you've opted in for follow-up contact, we will be in touch soon. Otherwise, thank you again for your valuable contribution to this important work!

Appendix D: Careers Counsellor Survey

Careers Counsellors Geospatial Skills Survey

Help Shape the Future of Geospatial Careers in Scotland

"Geospatial" refers to information that is related to specific locations on Earth. Geospatial skills involve mapping objects, events, or other real-world phenomena to their specific geographical location.

Scotland's geospatial sector is evolving rapidly, with projections valuing it at over £9 billion by 2027, and Scotland is positioning itself as the next global leader in the geospatial industry. Yet, despite this growth, the sector faces significant challenges: 70% of organisations report skills-related difficulties with their current employees, over half struggle to recruit, and 81% find it hard to retain talent.

To help address these challenges, Location Data Scotland (LDS), in collaboration with the University of Edinburgh and AGI Scotland, is leading a national initiative to raise awareness of geospatial career pathways and improve access to relevant skills training. As part of this work, we have partnered with Fife College to launch the Geospatial Foundation Skills Programme—an innovative, accessible starting point designed to inspire new entrants into the sector, particularly through schools, colleges, and career advisors.

This survey is part of that wider effort to understand how we can better equip those in advisory roles — such as careers advisors, employability practitioners, and educators — with the knowledge and tools to support the next generation of geospatial professionals. It also forms part of my MSc Dissertation, and is intended to provide information on helpful features for a website dedicated to promoting geospatial careers to students. All answers will be anonymous, and data will be stored, accessed, and analysed on secure university servers in accordance with academic research protocols.

We want to hear from you. Your responses will inform the ongoing development of resources, courses, and outreach initiatives to ensure Scotland builds a future-ready geospatial workforce.

The survey should take no longer than 5-10 minutes.

Section 1

...

Understanding Your Experience with Geospatial Careers

1. How familiar are you with the concept of *geospatial* skills and technologies? *

- ☐ Not at all familiar
- ☐ Somewhat familiar
- ☐ Very familiar

2. How familiar are you with the types of *careers* that use geospatial skills and technologies? (Examples: *GIS analyst, urban planner, environmental consultant, drone operator, cartographer*) *

- ☐ Not at all familiar
- ☐ Somewhat familiar
- ☐ Very familiar

3. Have you ever recommended a geospatial related career (ie. GIS analyst, urban planner, drone operator, cartographer, etc.) to a student? *

- ☐ Yes
- ☐ No

...

4. If you answered no to the previous question, why not?

Enter your answer

Identifying Your Information Needs

5. Please rank these types of information in order by how helpful they would be for guiding students towards geospatial careers, from Most Helpful to Least Helpful *

Career pathways and job roles
Required skills
Suggested school subjects or study routes
Industry trends and job outlook
Salary information
Real-world career spotlights or case studies

6. Are there any other types of information that would be useful in recommending geospatial careers? ...

Enter your answer

Designing a Supportive Careers Website

7. What types of features would make a geospatial careers website valuable for your work with students? *

Please select at most 5 options.

- ☐ Searchable career database
- ☐ Videos or career spotlights
- ☐ Downloadable handouts or infographics
- ☐ Career pathways maps
- ☐ Interest assessment or career matching tools
- ☐ Virtual job shadowing or industry tours
- ☐ Information about a geospatial ambassador programme
- ☐ Resources for collaborating with teachers to promote geospatial skills
- ☐ Other

8. Would you be interested in a tool that shows how geospatial skills align with student interests (e.g. tech, outdoors, sustainability)? *

- ☐ Yes
- ☐ No
- ☐ Maybe

9. What would make a geospatial career website most helpful for your role? *

Enter your answer

Section 4

...

Understanding The Challenges You Face

10. What challenges or barriers do you face when trying to introduce students to lesser-known career fields? *

Enter your answer

Section 5

...

Final Comments and Follow-Up

11. Do you have any other comments or suggestions to support this work?

Enter your answer

12. If you would be interested in completing a follow-up interview or conversation, please leave your name and email address below.

Enter your answer

Section 6

...

Thank You!

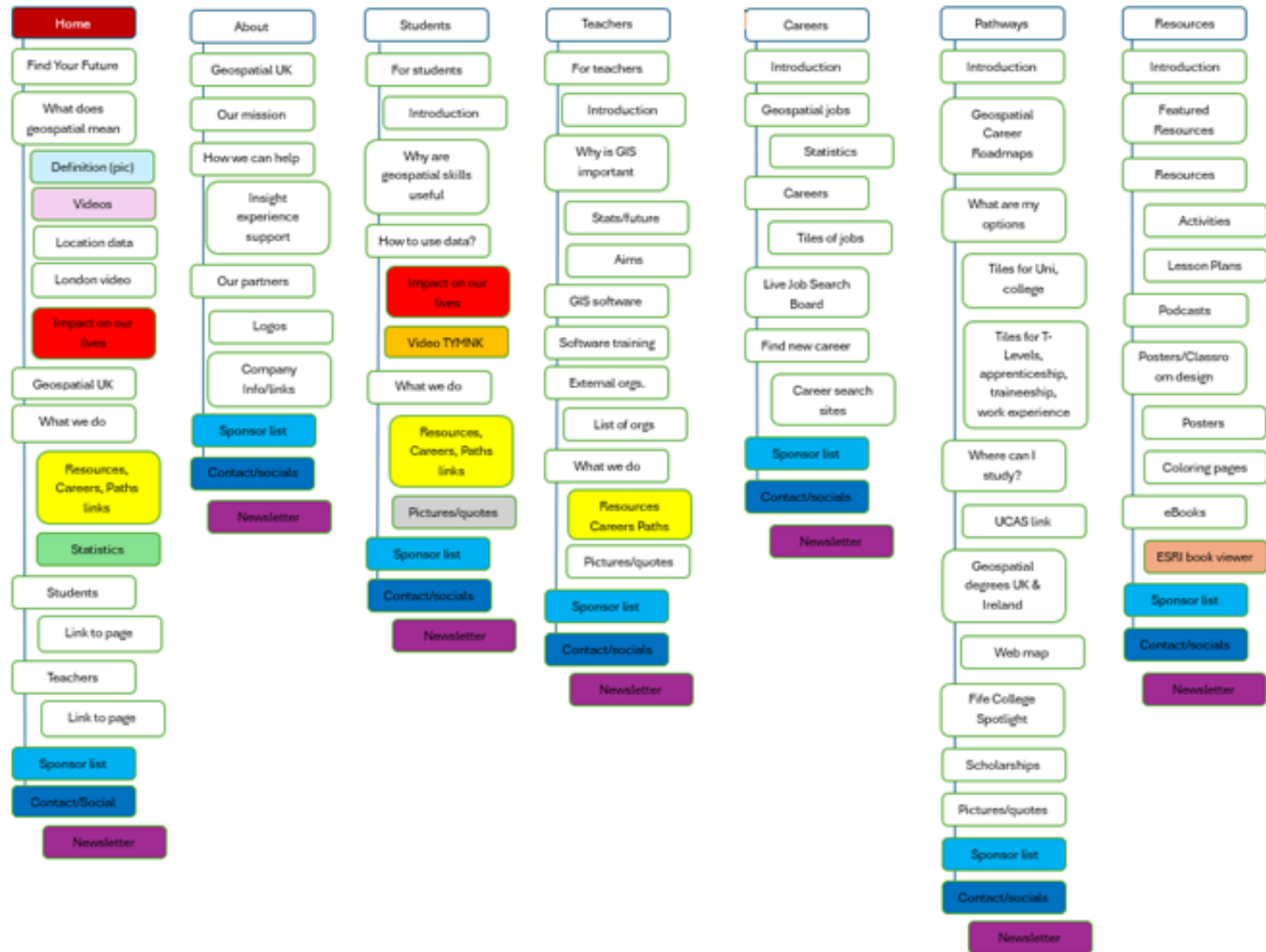
Thank you for taking the time to complete this survey. Your insights are greatly appreciated and will play a key role in helping shape geospatial careers resources for students and advisors across Scotland.

If you've opted in for follow-up contact, we will be in touch soon. Otherwise, thank you again for your valuable contribution to this important work!

Appendix E: Initial Website Map of Geospatial UK



Appendix F: Final Website Map of Geospatial UK



Appendix G: Training Materials for Chatbot

Chatbot Websites

Website Name	Website URL
Location Data Scotland	https://www.locationdatascotland.com
2024 UK Geospatial Sector Market Report	Geospatial Sector Market Report 2024 - GOV.UK
UK Geospatial Strategy 2030	UK Geospatial Strategy 2030 - GOV.UK
UK Government Geospatial Insights Blog	Geospatial Insights – News and updates from the Geospatial Commission
Geospatial UK	https://www.geospatialuk.org

Chatbot Questions and Answers

Question: What is geospatial?

Answer: Geospatial refers to information about natural or human processes that are related to specific locations on Earth, which can be analysed and measured in a variety of different ways, for a variety of different purposes. Geospatial skills involve mapping objects, events, or other real-world phenomena to their specific geographical location. Geospatial includes traditional Geographic Information Sciences (GIS), and remote sensing via satellites, drones, and other aircraft.

Question: What is GIS?

Answer: Geographic Information Sciences, or GIS, is a system that captures, stores, analyses, and displays geographic data. It combines geographic, or location data, with descriptive attribute data to tell a story. The use of a GIS allows us to see and understand patterns and relationships in their geographic contexts, in order to allow for better problem solving and decision making.

Question: What is remote sensing?

Answer: Remote sensing is the scanning of the earth using satellites, drones, planes, and other aircraft.

Question: What is the current state of the geospatial industry in the UK?

Answer: The UK government estimates that there are over 2600 companies in the UK that mainly work with or rely on geospatial or location data as a core part of their services. The geospatial industry employs over 37,000 people in the UK. The geospatial

industry brings in roughly £9-11 billion annually to the UK economy, and is experiencing an average growth rate of at least 10.5%. However, a majority of employers are having a difficult time either recruiting or retaining talent with the necessary skills.

Question: What kinds of jobs use geospatial skills?

Answer: Classic geospatial jobs include GIS Analyst, Land Surveyor, or Urban Planner. Other jobs that include the use of geospatial data include Drone Pilot, Ecologist and Conservationist, Games Developer, and Weather Forecaster, and more. Check out the Careers page for more information on different geospatial careers!

Question: Where can I find available jobs in the geospatial industry?

Answer: Check out the Careers page for a live job board, and other job search resources.

Question: I am interested in the geospatial industry, but don't know where to start.

Answer: You've come to the right place! Check out the Pathways page for information on how to enter the geospatial industry. Don't forget the Careers page, which shows you different careers within geospatial!

Question: I'm a teacher, and looking for resources or activities for my students. Where can I go to find them?

Answer: Great! Your students will love getting to interact with all sorts of geospatial data. Check out the Resources page for resources related to Geography, Mapping, Coding, Maths and Sciences, and much more!

Question: I looked at your Resources page, but didn't see what I was looking for. How can I find it?

Answer: That's a great question! We can't catalogue every possible resource, but let me help you find more. Search for your topic online, plus additional key search terms such as 'gis' or 'geospatial,' 'web mapping,' or 'visualiser.'

Question: How does geospatial relate to different subjects?

Answer: This is an excellent question! Geospatial has a clear relationship with Geography, sciences like Geology, and various areas of Computer Science or IT. However, geospatial is also related to sciences like Biology or Physics, Climate Change, Business, Sociology, History, and even Art! Geospatial can show us how healthy our forests are, tell us how animal and habitat conservation efforts are going, provide the most recent research into climate change, help us decide on a place for a new store or warehouse location, give us a bird's eye view on historical battles or human migration patterns, and inspire cool art and maps!

Geospatial Career Roadmap for Scotland



Geospatial Career Roadmap for England, Wales, and Northern Ireland



Appendix H: College and University Programs with Geospatial Components

Name	Website	Programs	Latitude	Longitude
University of Edinburgh	https://www.ed.ac.uk	– MSc Geographical Information Science – MSc Earth Observation and Geoinformation Management	55.94522	-3.18803
University of Newcastle	https://www.ncl.ac.uk	– Msc Hons Mapping and Geospatial Data Science	54.97937	-1.61509
Fife College	https://www.fife.ac.uk	– Geospatial Foundation Skills Programme	56.0933	-3.41016
Aston University	https://www.aston.ac.uk	– BSc Computer Science	52.486269	-1.891316
Birkbeck, University of London	https://www.bbk.ac.uk	– PG Cert Climate Change – MSc Geographical Data Science	51.522	-0.13025
Canterbury Christ Church University	https://www.canterbury.ac.uk	– BSc Geography	51.27963	1.0899
Cranfield University	https://www.cranfield.ac.uk	– MSc Geographical Information Management	52.0741	-0.62816
Edge Hill University	https://www.edgehill.ac.uk	– BSc Physical Geography & Geology	53.55914	-2.87047
Liverpool Hope University	https://www.hope.ac.uk	– BSc Computer Science & Geography – BSc Computer Science & Human Geography – BA Digital Creativity and Geography – BA Digital Creativity and IT – BA Drama and Human Geography – BA Early Childhood and Human Geography	53.39092	-2.89232

Name	Website	Programs	Latitude	Longitude
		– BA Economics and Human Geography – BA Education and Human Geography – BA English Language and Human Geography – BSc Geography and IT – BA Human Geography and IT – BSc Physical Geography		
Northumbria University	https://www.northumbria.ac.uk	– Architecture and Built Environment Foundation Year (L3) – BSc Hons Building Surveying – BSc Hons Quantity Surveying – MSc Surveying – BSc Hons Real Estate – MSc Real Estate/International Real Estate – BSc Construction Management – Chartered Surveyor Degree Apprenticeship – Civil Engineering BEng and Degree Apprenticeship	55.00352	-1.57359
Nottingham Trent University	https://www.ntu.ac.uk	– BSc Hons Building Surveying – MSc Building Surveying – Geophysical and Geotechnical Investigation and Design Short Course	52.91219	-1.18245

Name	Website	Programs	Latitude	Longitude
Oxford Brookes University	https://www.brookes.ac.uk	– BSc Animal Biology and Conservation	51.75513	-1.22421
Queen Mary University London	https://www.qmul.ac.uk	– BSc Environmental Science – BSc Geography	51.52409	-0.04042
Robert Gordon University	https://www.rgu.ac.uk	– Architectural Technology – BSc Hons Construction and the Built Environment – MSc Building Surveying – PgCert/PgDip/MSc Construction Project Management	57.11942	-2.14099
Swansea University	https://www.swansea.ac.uk	– MSc Geographic Information and Climate Change	51.60926	-3.97994
Technological University Dublin	https://www.dit.ie	– BSc Hons Geospatial Surveying – BSc Hons Geospatial Surveying – Earn as You Learn – MSc Geographical Information Science – Geographical Information Science	53.35126	-6.26867
Ulster University	https://www.ulster.ac.uk	– PgDip/MSc Geographic Information Systems – PgDip/MSc Environmental Management with Geographic Information Systems – PgDip/MSc Remote Sensing and Geographic Information Systems – BSc Hons Geography – PgDip/MSc Environmental Toxicology and Pollution Monitoring	54.605337	-5.929483

Name	Website	Programs	Latitude	Longitude
		– BSc Hons Geography with Education		
University College London	https://www.ucl.ac.uk	– MSc Geospatial Sciences – MSc Geospatial Sciences – Hydrographic Surveying – MSc Geospatial Sciences – Building Information Modelling and Surveying – MSc Geospatial Sciences – Geographic Information Science and Computing – MSc Remote Sensing and Environmental Mapping – MSc Spatio-temporal Analytics and Big Data Mining	51.52458	-0.13478
University of Aberdeen	https://www.abdn.ac.uk	– BSc Hons Geoscience – MSc Applied Marine and Fisheries Ecology – MSc Geophysics	57.16475	-2.10071
University of Brighton	https://www.brighton.ac.uk	– BSc Hons Building Surveying – BSc Hons Architectural Technology – Chartered Town Planner MSc Apprenticeship – BSc Hons Construction Management – MSc/PgCert/PgDip Construction Management – MRes Geoarchaeology	50.86404	-0.10921

Name	Website	Programs	Latitude	Longitude
		– PgDip Geographical Information Systems and Environmental Management – BSc Hons Geography with Remote Sensing – MRes Geoscience – MRes GIS and Remote Sensing – MSc Town Planning		
University of East London	https://www.ucl.ac.uk	– BSc Hons Surveying and Mapping Sciences – BSc Hons Quantity Surveying and Commercial Management – Msc Computer Science	51.55179	0.112
University of Exeter	https://www.exeter.ac.uk	– BSc Hons Geography with Applied GIS – BSc Hons Engineering Geology and Geotechnics – MSc Geographical Information Science – MSc/PgDip Surveying and Land/Environmental Management – MSc Geotechnical Engineering	50.73451	-3.53552
University of Glasgow	https://www.gla.ac.uk	– MSc/PgDip/PgCert Geoinformation Technology and Cartography – MSc/PgDip/PgCert Geospatial and Mapping Sciences – MA Digital Media, Information Studies, and Geography	55.87210	-4.26859

Name	Website	Programs	Latitude	Longitude
		– MSc Geomatics and Management – MSc/PgDip/PgCert Land and Hydrographic Surveying – MSc Land and Hydrographic Surveying with work placement – MSc Urban Analytics – MSc Sustainable Water Environments – MSc Urban Transport – MSc Geospatial Data Science		
University of the Highlands and Islands	https://www.uhi.ac.uk	– BSc Archaeology and Environmental Studies – BSc Geography	57.47545	-4.18408
University of Leeds	https://www.leeds.ac.uk	– BA Geography with Quantitative Research Methods – BSc Geography with Environmental Mathematics – MSc Geographical Information Systems – MSc River Basin Dynamics with Geographical Information Systems – MSc Urban Data Science and Analytics – MSc Consumer Analytics and Marketing Strategy – MSc Data Science and Analytics	53.80728	-1.55229
University of Leicester	https://www.le.ac.uk	– MSc Geographical Information Science	52.62194	-1.12463

Name	Website	Programs	Latitude	Longitude
		– Mphil Human and Social Geography		
University of Liverpool	https://www.liverpool.ac.uk	– MSc Geographic Data Science	53.40481	-2.9653
University of Manchester	https://www.manchester.ac.uk	– MSc Geographical Information Science	53.46571	-2.23271
University of Oxford	https://www.oxford.ac.uk	– PhD Geography and the Environment	51.7571	-1.25454
University of Plymouth	https://www.plymouth.ac.uk	– BSc Hons Building Surveying – BSc Hons Ocean Exploration and Surveying – BSc Hons Oceanography and Coastal Processes – MSc Hydrography – MSc Coastal Engineering	50.37439	-4.13888
University of Salford	https://www.salford.ac.uk	– BSc Environmental Geography – MSc/PgDip/PgCert BIM and Digital Built Environments – BSc Hons Building Surveying – BSc Hons Building Surveying Chartered Surveyor Degree Apprenticeship – MSc Building Surveying – BSc Hons Building Surveying with Foundation Year – BSc Hons Construction Project Management – BSc Hons Construction Project Management with Foundation Year	53.49603	-2.27587

Name	Website	Programs	Latitude	Longitude
University of Southampton	https://www.southampton.ac.uk	– MSc Applied Geographical Information Systems and Remote Sensing	50.93744	-1.39733
University of South Wales	https://www.southwales.ac.uk	– BSc Natural History – BSc Natural History and Media	51.47906	-3.16936
University of Staffordshire	https://www.staffs.ac.uk	– BSc Computer Science	53.00943	-2.17333
University of Stirling	https://www.stir.ac.uk	– BSc Hons Environmental Geography – BSc Hons Environmental Geography and Outdoor Education – MSc Environmental Remote Sensing and Geospatial Sciences – MSc Environmental Management	56.1461	-3.9195
University of Sussex	https://www.sussex.ac.uk	– BA Geography with a Language	50.86773	-0.08755
University of Wales	https://www.uwtsd.ac.uk	– BSc/HND/HNC Building Surveying – Bsc/HND Computing (Data and Information Systems)	52.41133	-4.05462
University of Warwick	https://www.warwick.ac.uk	– BSc/MEng Computer Science – BSc Computer Science and Business Studies – BEng/MEng Computer Systems Engineering – MEng Discrete Mathematics	52.37929	-1.56147
University of Wolverhampton	https://www.wlv.ac.uk	– BSc Hons Building Surveying – BSc Hons Building Surveying with Foundation Year – Building Surveying with Sandwich Placement	52.58726	-2.12764

Name	Website	Programs	Latitude	Longitude
		– Building Control Surveying Degree Apprenticeship – HNC Construction and the Built Environment		

University	Logo URL
University of Edinburgh	https://static.wixstatic.com/media/4883c1_f7ce9dda705640c8bd5a2b588e211948~mv2.png
University of Newcastle	https://static.wixstatic.com/media/4883c1_f4ab9fe9d8ec4391896e4b08118f63a9~mv2.png
Fife College	https://static.wixstatic.com/media/a1ea09_c1925726641a49839216f44062aa903a~mv2.png
Aston University	https://static.wixstatic.com/media/a1ea09_489e2db5f7c14c638e508707b84b756f~mv2.jpg
Birkbeck, University of London	https://static.wixstatic.com/media/a1ea09_b0051b3afd1a4211b0107f527e254eb2~mv2.png
Canterbury Christ Church Uni.	https://static.wixstatic.com/media/a1ea09_098701292d514bc6a229672a648a050f~mv2.jpg
Cranfield University	https://static.wixstatic.com/media/a1ea09_7a0c263d5a834f0ebec9bec6410dfa52~mv2.png
Edge Hill University	https://static.wixstatic.com/media/a1ea09_18089221e9bd4289bf86b8faf5d95d22~mv2.png
Liverpool Hope University	https://static.wixstatic.com/media/a1ea09_1a7de8c246594e03a46cc374d2a8e005~mv2.png
Northumbria University	https://static.wixstatic.com/media/4883c1_d6d58396a7954d628f484a7d66724ef7~mv2.jpg
Nottingham Trent University	https://static.wixstatic.com/media/4883c1_a8d6f5297c3f47fba3c587e7be37b22d~mv2.png
Oxford Brookes University	https://static.wixstatic.com/media/a1ea09_d939135517344bf7a9e893a4817c4cdd~mv2.png
Queen Mary University London	https://static.wixstatic.com/media/a1ea09_9632461c89034df08a59a624a0c3e63a~mv2.png
Robert Gordon University	https://static.wixstatic.com/media/4883c1_946df7cd2c014936b27fd4947b532445~mv2.jpg
Swansea University	https://static.wixstatic.com/media/a1ea09_062c041b716742f6853fff996318a8e1~mv2.png
Technological University Dublin	https://static.wixstatic.com/media/4883c1_bbc1abe01b0f4fbc991d3f052a05830c~mv2.jpg
Ulster University	https://static.wixstatic.com/media/a1ea09_e484de61014e40f398b6008554ceddf4~mv2.jpg
University College London	https://static.wixstatic.com/media/4883c1_9b639fd2e77d493aad09c729833fdd54~mv2.png
University of Aberdeen	https://static.wixstatic.com/media/4883c1_9e6ab20bbe1447b99008abf14acbdfe3~mv2.png
University of Brighton	https://static.wixstatic.com/media/4883c1_8237413a167444eea9f1896d9548250d~mv2.png
University of East London	https://static.wixstatic.com/media/4883c1_e20c8f5fa0cf4eee9128587465f6aa0c~mv2.jpg
University of Exeter	https://static.wixstatic.com/media/4883c1_820b818e951a47819e3ce4e94f4d7c59~mv2.jpg

University of Glasgow	https://static.wixstatic.com/media/4883c1_c05838122f434e2a85814c8a627a3875~mv2.png
University of the Highlands and Islands	https://static.wixstatic.com/media/a1ea09_7661ccacf1a246f1a97d71c6f541e391~mv2.jpg
University of Leeds	https://static.wixstatic.com/media/4883c1_b5d9082072b2448e86639583cf1b64b1~mv2.jpg
University of Leicester	https://static.wixstatic.com/media/a1ea09_231848194f1c4be7a1ecd5fdffed845b~mv2.webp
University of Liverpool	https://static.wixstatic.com/media/a1ea09_f2af09edd61f44dfa7e7967ef20ff6f2~mv2.jpg
University of Manchester	https://static.wixstatic.com/media/a1ea09_6b66d159c0b846b1a4ec543335cb8509~mv2.webp
University of Oxford	https://static.wixstatic.com/media/a1ea09_96cbb5c9b66b4f63a80bc0bc3592e001~mv2.webp
University of Plymouth	https://static.wixstatic.com/media/4883c1_68708475b0a0467da1e96e7d06616d84~mv2.png
University of Salford	https://static.wixstatic.com/media/4883c1_d8be96b38456425e8d46fac3755a10c2~mv2.jpg
University of Southampton	https://static.wixstatic.com/media/a1ea09_9ff01cedebc64b7a9d8afaaf411ef3b6~mv2.jpg
University of South Wales	https://static.wixstatic.com/media/a1ea09_faf2087495834461bfef61b7876542b4~mv2.png
University of Staffordshire	https://static.wixstatic.com/media/a1ea09_d8af42c6f9ed4912a6a4b62213432fa0~mv2.png
University of Stirling	https://static.wixstatic.com/shapes/a1ea09_9d2965dbac3f4c9ebd86e387ad2127ea.svg
University of Sussex	https://static.wixstatic.com/media/a1ea09_db83e62f0f2b4d2bb0e88a2eefbb5a17~mv2.png
University of Wales	https://static.wixstatic.com/media/4883c1_feef7b310c7d42acbc432609e6e4b4e4~mv2.png
University of Warwick	https://static.wixstatic.com/media/a1ea09_00597fcd81cc4f20bbdc7f4c97032231~mv2.png
University of Wolverhampton	https://static.wixstatic.com/media/4883c1_fc31d25886db4af789931e106bc7cb8e~mv2.png

Appendix I: Web Map Code

```
1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4  <!-- set character coding and viewport -->
5  <meta charset="UTF-8">
6  <title>University Locations Map</title>
7  <meta name="viewport" content="width=device-width, initial-
  scale=1.0">
8  <!-- import Leaflet CSS -->
9  <link rel="stylesheet"
  href="https://unpkg.com/leaflet/dist/leaflet.css" />
10 <!-- import Roboto font -->
11 <link
  href="https://fonts.googleapis.com/css2?family=Roboto:wght@400&displ
  ay=swap" rel="stylesheet">
12 <!-- set CSS style for map and sidebar -->
13 <style>
14 /* set map and sidebar next to each other */
15 body { margin: 0; display: flex; }
16 /* set size of map, set map at 75% of viewport */
17 #map { height: 100vh; flex: 75%; }
18 /* set sidebar at 25% of viewport, enable scrolling for overflow,
  use Roboto font */
19 #sidebar { flex: 25%; overflow-y: auto; height: 100vh; padding:
  10px; font-family: 'Roboto', sans-serif }
20 /* set styles for images in sidebar */
21 #sidebar img { width: 50px; height: auto; float: left; margin-right:
  10px; }
22 #sidebar div { margin-bottom: 20px; }
23 </style>
```

```

24 </head>
25 <body>
26
27 <div id="map"></div>
28 <div id="sidebar"></div>
29
30 <script src="https://unpkg.com/leaflet/dist/leaflet.js"></script>
31 <script>
32 // create university variable with name, website, programs, lat/lng
   coordinates, and logo for each one
33 var universities = [
34 {
35   name: "University of Edinburgh",
36   website: "https://www.ed.ac.uk",
37   programs: [
38     "MSc Geographical Information Science",
39     "MSc Earth Observation and Geoinformation Management"
40   ],
41   lat: 55.94522, lng: -3.18803,
42   logo: "https://static.wixstatic.com/media/4883c1_f7ce9dda70564-
     0c8bd5a2b588e211948~mv2.png"
43 },
44 {
45   name: "University of Newcastle",
46   website: "https://www.ncl.ac.uk",
47   programs: [
48     "Msc Hons Mapping and Geospatial Data Science"
49   ],
50   lat: 54.97937, lng: -1.61509,

```

```

51 logo: "https://static.wixstatic.com/media/4883c1_f4ab9fe9d8ec4-
391896e4b08118f63a9~mv2.png"
52 },
53 {
54 name: "Fife College",
55 website: "https://www.fife.ac.uk",
56 programs: [
57 "Geospatial Foundation Skills Programme"
58 ],
59 lat: 56.0933, lng: -3.41016,
60 logo: "https://static.wixstatic.com/media/a1ea09_c1925726641a4-
9839216f44062aa903a~mv2.png"
61 },
62 {
63 name: "Aston University",
64 website: "https://www.aston.ac.uk",
65 programs: [
66 "BSc Computer Science"
67 ],
68 lat: 52.486269, lng: -1.891316,
69 logo: "https://static.wixstatic.com/media/a1ea09_489e2db5f7c14-
c638e508707b84b756f~mv2.jpg"
70 },
71 {
72 name: "Birkbeck, University of London",
73 website: "https://www.bbk.ac.uk",
74 programs: [
75 "PG Cert Climate Change",
76 "MSc Geographical Data Science"
77 ],

```

```

78   lat: 51.522, lng: -0.13025,
79   logo: "https://static.wixstatic.com/media/a1ea09_b0051b3afd1a4-
      211b0107f527e254eb2~mv2.png"
80   },
81   {
82     name: "Canterbury Christ Church University",
83     website: "https://www.canterbury.ac.uk",
84     programs: [
85       "BSc Geography"
86     ],
87     lat: 51.27963, lng: 1.0899,
88     logo: "https://static.wixstatic.com/media/a1ea09_098701292d514-
      bc6a229672a648a050f~mv2.jpg"
89   },
90   {
91     name: "Cranfield University",
92     website: "https://www.cranfield.ac.uk",
93     programs: [
94       "MSc Geographical Information Management"
95     ],
96     lat: 52.0741, lng: -0.62816,
97     logo: "https://static.wixstatic.com/media/a1ea09_7a0c263d5a834-
      f0ebec9bec6410dfa52~mv2.png"
98   },
99   {
100    name: "Edge Hill University",
101    website: "https://www.edgehill.ac.uk",
102    programs: [

```

```

10 "BSc Physical Geography & Geology"
3
10 ],
4
10 lat: 53.55914, lng:-2.87047,
5
10 logo: "https://static.wixstatic.com/media/a1ea09_18089221e9bd4-
6 289bf86b8faf5d95d22~mv2.png"
10 },
7
10 {
8
10 name: "Liverpool Hope University",
9
11 website: "https://www.hope.ac.uk",
0
11 programs: [
1
11 "BSc Computer Science & Geography",
2
11 "BSc Computer Science & Human Geography",
3
11 "BSc Geography and IT",
4
11 "BSc Physical Geography",
5
11 "BA Digital Creativity and Geography",
6
11 "BA Digital Creativity and IT",
7
11 "BA Drama and Human Geography",
8
11 "BA Early Childhood and Human Geography",
9
12 "BA Economics and Human Geography",
0

```

```

12  "BA Education and Human Geography",
1
12  "BA Human Geography and IT"
2
12  ],
3
12  lat: 53.39092, lng: -2.89232,
4
12  logo: "https://static.wixstatic.com/media/a1ea09_1a7de8c246594-
5  e03a46cc374d2a8e005~mv2.png"
12  },
6
12  {
7
12  name: "Northumbria University",
8
12  website: "https://www.northumbria.ac.uk",
9
13  programs: [
0
13  "Architecture and Built Environment Foundation Year (L3)",
1
13  "BSc Hons Building Surveying",
2
13  "BSc Hons Quantity Surveying",
3
13  "BSc Hons Real Estate",
4
13  "BSc Construction Management",
5
13  "MSc Surveying",
6
13  "MSc Real Estate & International Real Estate",
7
13  "Chartered Surveyor Degree Apprenticeship",
8

```

```

13  "Civil Engineering BEng and Degree Apprenticeship"
9
14  ],
0
14  lat: 55.00352, lng: -1.57359,
1
14  logo: "https://static.wixstatic.com/media/4883c1_d6d58396a7954-
2  d628f484a7d66724ef7~mv2.jpg"
14
3  },
14
4  {
14
5  name: "Nottingham Trent University",
14
6  website: "https://www.ntu.ac.uk",
14
7  programs: [
14
8  "BSc Hons Building Surveying",
14
9  "MSc Building Surveying",
15
0  "Geophysical and Geotechnical Investigation and Design Short Course"
15
1  ],
15
2  lat: 52.91219, lng: -1.18245,
15
3  logo: "https://static.wixstatic.com/media/4883c1_a8d6f5297c3f4-
3  7fba3c587e7be37b22d~mv2.png"
15
4  },
15
5  {
15
6  name: "Oxford Brookes University",

```

```

15 website: "https://www.brookes.ac.uk",
7
15
8 programs: [
15
9 "BSc Animal Biology and Conservation"
16
0 ],
16
1 lat: 51.75513, lng: -1.22421,
16
2 logo: "https://static.wixstatic.com/media/a1ea09_d939135517344-
2 bf7a9e893a4817c4cdd~mv2.png"
16
3 },
16
4 {
16
5 name: "Queen Mary University London",
16
6 website: "https://www.qmul.ac.uk",
16
7 programs: [
16
8 "BSc Environmental Science",
16
9 "BSC Geography"
17
0 ],
17
1 lat: 51.52409, lng: -0.04042,
17
2 logo: "https://static.wixstatic.com/media/a1ea09_9632461c89034-
2 df08a59a624a0c3e63a~mv2.png"
17
3 },
17
4 {

```

```

17 name: "Robert Gordon University",
5
17 website: "https://www.rgu.ac.uk",
6
17 programs: [
7
17 "Architectural Technology",
8
17 "BSc Hons Construction and the Built Environment",
9
18 "MSc Building Surveying",
0
18 "PG Cert/PG Dip/MSc Construction Project Management"
1
18 ],
2
18 lat: 57.11942, lng: -2.14009,
3
18 logo: "https://static.wixstatic.com/media/4883c1_946df7cd2c014-
4 936b27fd4947b532445~mv2.jpg"
18 },
5
18 {
6
18 name: "Swansea University",
7
18 website: "https://www.swansea.ac.uk",
8
18 programs: [
9
19 "MSc Geographic Information and Climate Change"
0
19 ],
1
19 lat: 51.60926, lng: -3.97994,
2

```

```

19 logo: "https://static.wixstatic.com/media/a1ea09_062c041b71674-
3 2f6853fff996318a8e1~mv2.png"

19 },
4

19 {
5

19 name: "Technological University Dublin",
6

19 website: "https://www.dit.ie",
7

19 programs: [
8

19 "BSc Hons Geospatial Surveying",
9

20 "BSc Hons Geospatial Surveying -- Earn as You Learn",
0

20 "MSc Geographical Information Science"
1

20 ],
2

20 lat: 53.35126, lng: -6.26867,
3

20 logo: "https://static.wixstatic.com/media/4883c1_bbclabe01b0f4-
4 fbc991d3f052a05830c~mv2.jpg"

20 },
5

20 {
6

20 name: "Ulster University",
7

20 website: "https://www.ulster.ac.uk",
8

20 programs: [
9

21 "BSc Hons Geography",
0

```

```

21 "BSc Hons Geography with Education",
1
21 "PG Dip/MSc Geographic Information Systems",
2
21 "PG Dip/MSc Environmental Management with Geographic Information
3 Systems",
21 "PG Dip/MSc Environmental Toxicology and Pollution Monitoring",
4
21 "PG Dip/MSc Remote Sensing and Geographic Information Systems"
5
21 ],
6
21 lat: 54.605337, lng: -5.929483,
7
21 logo: "https://static.wixstatic.com/media/a1ea09_e484de61014e4-
8 0f398b6008554ceddf4~mv2.jpg"
21 },
9
22 {
0
22 name: "University College London",
1
22 website: "https://www.ucl.ac.uk",
2
22 programs: [
3
22 "MSc Geospatial Sciences",
4
22 "MSc Geospatial Sciences and Hydrographic Surveying",
5
22 "MSc Geospatial Sciences, Building Information Modelling and
6 Surveying",
22 "MSc Geospatial Sciences, GIS and Computing",
7
22 "MSc Remote Sensing and Environmental Mapping",
8

```

```

22  "MSc Spatio-temporal Analytics and Big Data Mining"
9
23  ],
0
23  lat: 51.52458, lng: -0.13478,
1
23  logo: "https://static.wixstatic.com/media/4883c1_9b639fd2e77d4-
2  93aad09c729833fdd54~mv2.png"
23
3  },
23
4  {
23
5  name: "University of Aberdeen",
23
6  website: "https://www.abdn.ac.uk",
23
7  programs: [
23
8  "BSc Hons Geography",
23
9  "MSc Geophysics",
24
0  "MSc Applied Marine and Fisheries Ecology"
24
1  ],
24
2  lat: 57.16475, lng: -2.10071,
24
3  logo: "https://static.wixstatic.com/media/4883c1_9e6ab20bbe144-
4  7b99008abf14acbdfe3~mv2.png"
24
5  },
24
6  {
24
7  name: "University of Brighton",

```

```

24 website: "https://www.brighton.ac.uk",
7
24
8 programs: [
24
9 "BSc Hons Building Surveying",
25
0 "BSc Hons Architectural Technology",
25
1 "BSc Hons Geography with Remote Sensing",
25
2 "MSc Town Planning",
25
3 "MSc Chartered Town Planner Apprenticeship",
25
4 "MSc/PG Cert/PG Dip Construction Management",
25
5 "PG Dip Geographical Information Systems and Environmental
6 Management",
25
6 "MRes Geoarchaeology",
25
7 "MRes Geoscience",
25
8 "MRes GIS and Remote Sensing"
25
9 ],
26
0 lat: 50.86404, lng: -0.10921,
26
1 logo: "https://static.wixstatic.com/media/4883c1_8237413a16744-
2 4eea9f1896d9548250d~mv2.png"
26
3 {
26
4 name: "University of East London",

```

```

26 website: "https://www.ucl.ac.uk",
5
26
6 programs: [
26
7 "BSc Hons Surveying and Mapping Sciences",
26
8 "BSc Hons Quantity Surveying and Commercial Management",
26
9 "MSc Computer Science"
27
0 ],
27
1 lat: 51.55179, lng: 0.112,
27
2 logo: "https://static.wixstatic.com/media/4883c1_e20c8f5fa0cf4-
2 eee9128587465f6aa0c~mv2.jpg"
27
3 },
27
4 {
27
5 name: "University of Exeter",
27
6 website: "https://www.exeter.ac.uk",
27
7 programs: [
27
8 "BSc Hons Geography with Applied GIS",
27
9 "BSc Hons Engineering Geology and Geotechnics",
28
0 "MSc Geographical Information Science",
28
1 "MSc Geotechnical Engineering",
28
2 "MSc/PG Dip Surveying and Land/Environmental Management"

```

```

28  ],
3
28  lat: 50.73451, lng: -3.53552,
4
28  logo: "https://static.wixstatic.com/media/4883c1_820b818e951a4-
5  7819e3ce4e94f4d7c59~mv2.jpg"
28
28  },
6
28  {
7
28  name: "University of Glasgow",
8
28  website: "https://www.gla.ac.uk",
9
29  programs: [
0
29  "MA Digital Media, Information Studies, and Geography",
1
29  "MSc Geomatics and Management",
2
29  "MSc Land and Hydrographic Surveying with work placement",
3
29  "MSc Urban Analytics",
4
29  "MSc Sustainable Water Environments",
5
29  "MSc Urban Transport",
6
29  "MSc Geospatial Data Science",
7
29  "MSc/PG Dip/PG Cert Geoinformation Technology and Cartography",
8
29  "MSc/PG Dip/PG Cert Geospatial and Mapping Sciences",
9
30  "MSc/PG Dip/PG Cert Land and Hydrographic Surveying"
0

```

```

30  ],
1
30  lat: 55.87210, lng: -4.26859,
2
30  logo: "https://static.wixstatic.com/media/4883c1_c05838122f434-
3  e2a85814c8a627a3875~mv2.png"
30
4  },
30
5  {
30
6  name: "University of the Highlands and Islands",
30
7  website: "https://www.uhi.ac.uk",
30
8  programs: [
30
9  "BSc Archaeology and Environmental Studies",
31
0  "BSc Geography"
31
1  ],
31
2  lat: 57.47545, lng: -4.18408,
31
3  logo: "https://static.wixstatic.com/media/a1ea09_7661ccacf1a24-
3  6f1a97d71c6f541e391~mv2.jpg"
31
4  },
31
5  {
31
6  name: "University of Leeds",
31
7  website: "https://www.leeds.ac.uk",
31
8  programs: [

```

```

31  "BA Geography with Quantitative Research Methods",
9
32  "BSc Geography with Environmental Mathematics",
0
32  "MSc Geographical Information Systems",
1
32  "MSc River Basin Dynamics with GIS",
2
32  "MSc Urban Data Science and Analytics",
3
32  "MSc Consumer Analytics and Marketing Strategy",
4
32  "MSc Data Science and Analytics"
5
32  ],
6
32  lat: 53.80728, lng: -1.55229,
7
32  logo: "https://static.wixstatic.com/media/4883c1_b5d9082072b24-
8  48e86639583cf1b64b1~mv2.jpg"
32  },
9
33  {
0
33  name: "University of Leicester",
1
33  website: "https://www.leicester.ac.uk",
2
33  programs: [
3
33  "MSc Geographical Information Science",
4
33  "MPhil Human and Social Geography"
5
33  ],
6

```

```

33 lat: 52.62194, lng: -1.12463,
7
33 logo: "https://static.wixstatic.com/media/a1ea09_231848194f1c4-
8 be7a1ecd5fdffed845b~mv2.webp"
33
9 },
34
0 {
34
1 name: "University of Liverpool",
34
2 website: "https://www.liverpool.ac.uk",
34
3 programs: [
34
4 "MSc Geographic Data Science"
34
5 ],
34
6 lat: 53.40481, lng: -2.9653,
34
7 logo: "https://static.wixstatic.com/media/a1ea09_f2af09edd61f4-
8 4dfa7e7967ef20ff6f2~mv2.jpg"
34
9 },
34
0 {
35
1 name: "University of Manchester",
35
2 website: "https://www.manchester.ac.uk",
35
3 programs: [
35
4 "MSc Geographical Information Science"
35
5 ],
4

```

```

35 lat: 53.46571, lng: -2.23271,
5
35 logo: "https://static.wixstatic.com/media/a1ea09_6b66d159c0b84-
6 6b1a4ec543335cb8509~mv2.webp"
35
7 },
35
8 {
35
9 name: "University of Oxford",
36
0 website: "https://www.oxford.ac.uk",
36
1 programs: [
36
2 "PhD Geography and the Environment"
36
3 ],
36
4 lat: 51.7571, lng: -1.25454,
36
5 logo: "https://static.wixstatic.com/media/a1ea09_96cbb5c9b66b4-
6 f63a80bc0bc3592e001~mv2.webp"
36
7 },
36
8 {
36
9 name: "University of Plymouth",
36
0 website: "https://www.plymouth.ac.uk",
37
1 programs: [
37
2 "BSc Hons Building Surveying",
37
3 "BSc Hons Ocean Exploration and Surveying",

```

```

37 "BSc Hons Oceanography and Coastal Processes",
3
37 "MSc Hydrography",
4
37 "MSc Coastal Engineering"
5
37 ],
6
37 lat: 50.37439, lng: -4.13888,
7
37 logo: "https://static.wixstatic.com/media/4883c1_68708475b0a04-
8 67dale96e7d06616d84~mv2.png"
37 },
9
38 {
0
38 name: "University of Salford",
1
38 website: "https://www.salford.ac.uk",
2
38 programs: [
3
38 "BSc Environmental Geography",
4
38 "BSc Hons Building Surveying",
5
38 "BSc Hons Building Surveying Chartered Surveyor Degree
6 Apprenticeship",
38 "BSc Hons Building Surveying with Foundation Year",
7
38 "BSc Hons Construction Project Management",
8
38 "BSc Hons Construction Project Management with Foundation Year",
9
39 "MSc Building Surveying",
0

```

```

39 1 "MSc/PG Dip/PG Cert BIM and Digital Built Environments"
39 2 ],
39 3 lat: 53.49603, lng: -2.27587,
39 4 logo: "https://static.wixstatic.com/media/4883c1_d8be96b384564-
4 25e8d46fac3755a10c2~mv2.jpg"
39 5 },
39 6 {
39 7 name: "University of Southampton",
39 8 website: "https://www.southampton.ac.uk",
39 9 programs: [
40 0 "MSc Applied Geographical Information Systems and Remote Sensing"
40 1 ],
40 2 lat: 50.93744, lng: -1.39733,
40 3 logo: "https://static.wixstatic.com/media/a1ea09_9ff01cedebc64-
40 4 b7a9d8afaaf411ef3b6~mv2.jpg"
40 5 {
40 6 name: "University of South Wales",
40 7 website: "https://www.southwales.ac.uk",
40 8 programs: [

```

```

40  "BSc Natural History",
9
41  "BSc Natural History and Media"
0
41  ],
1
41  lat: 51.47906, lng: -3.16936,
2
41  logo: "https://static.wixstatic.com/media/alea09_faf2087495834-
3  461bfef61b7876542b4~mv2.png"
41  },
4
41  {
5
41  name: "University of Staffordshire",
6
41  website: "https://www.staffs.ac.uk",
7
41  programs: [
8
41  "BSc Computer Science"
9
42  ],
0
42  lat: 53.00943, lng: -2.17333,
1
42  logo: "https://static.wixstatic.com/media/alea09_d8af42c6f9ed4-
2  912a6a4b62213432fa0~mv2.png"
42  },
3
42  {
4
42  name: "University of Stirling",
5
42  website: "https://www.stir.ac.uk",
6

```

```

42 programs: [
7
42 "BSc Hons Environmental Geography",
8
42 "BSc Hons Environmental Geography and Outdoor Education",
9
43 "MSc Environmental Remote Sensing and Geospatial Sciences",
0
43 "MSc Environmental Management"
1
43 ],
2
43 lat: 56.1461, lng: -3.9195,
3
43 logo: "https://static.wixstatic.com/shapes/a1ea09_9d2965dbac3f4-
4 c9ebd86e387ad2127ea.svg"
43 },
5
43 {
6
43 name: "University of Sussex",
7
43 website: "https://www.sussex.ac.uk",
8
43 programs: [
9
44 "BA Geography with a Language"
0
44 ],
1
44 lat: 50.86773, lng: -0.08755,
2
44 logo: "https://static.wixstatic.com/media/a1ea09_db83e62f0f2b4-
3 d2bb0e88a2eefbb5a17~mv2.png"
44 },
4

```

```

44 {
5
44   name: "University of Wales",
6
44   website: "https://www.uwtsd.ac.uk",
7
44   programs: [
8
44     "BSc/HND/HNC Building Surveying",
9
45     "BSc/HND/HNC Computing (Data and Information Systems)"
0
45   ],
1
45   lat: 52.41133, lng: -4.05462,
2
45   logo: "https://static.wixstatic.com/media/4883c1_feef7b310c7d4-
3     2acbc432609e6e4b4e4~mv2.png"
45 },
4
45 {
5
45   name: "University of Warwick",
6
45   website: "https://www.warwick.ac.uk",
7
45   programs: [
8
45     "BSc/MEng Computer Science",
9
46     "BSc Computer Science and Business Studies",
0
46     "BEng/MEng Computer Systems Engineering",
1
46     "MEng Discrete Mathematics"
2

```

```

46  ],
3
46  lat: 52.37929, lng: -1.56147,
4
46  logo: "https://static.wixstatic.com/media/a1ea09_00597fcd81cc4-
5  f20bbdc7f4c97032231~mv2.png"
46
6  },
46
7  {
46
8  name: "University of Wolverhampton",
46
9  website: "https://www.wlv.ac.uk",
47
0  programs: [
47
1  "BSc Hons Building Surveying",
47
2  "BSc Hons Building Surveying with Foundation Year",
47
3  "Building Surveying with Sandwich Placement",
47
4  "Building Surveying Control Degree Apprenticeship",
47
5  "HNC Construction and the Built Environment"
47
6  ],
47
7  lat: 52.85726, lng: -2.12764,
47
8  logo: "https://static.wixstatic.com/media/4883c1_fc31d25886db4-
9  af789931e106bc7cb8e~mv2.png"
47
9  },
48
0  // Add more universities here if/when needed, make sure alphabetical

```

```

48 ];
1
48
2
48 // initialize map, set initial view to following coordinates with
3 zoom level 6
48
4 var map = L.map('map').setView([54.559322, -3.912204], 6);
48
5
48 // uses OpenStreetMaps for map background, sets max zoom level to 18
6
48 L.tileLayer('https://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png', {
7
48 maxZoom: 18,
8
48 attribution: 'Map data &copy; <a
9 href="https://www.openstreetmap.org/copyright">OpenStreetMap</a>
  contributors'
49 }).addTo(map);
0
49
1
49 // iterates over each university to place marker on map
2
49 // binds popup to marker showing each university's name, programs,
3 and website link
49
4 universities.forEach(function(university) {
48
5 var marker = L.marker([university.lat, university.lng]).addTo(map);
49
6 marker.bindPopup("<b>" + university.name + "</b><br><ul><li>" +
49
7 university.programs.join("</li><li>") +

```

```

49 "</li></ul><a href='" + university.website + "'
8   target='_blank'>Website</a>");
49
9
50 // creates entries in sidebar for each university with their logo,
0   name, programs, and website; makes each entry clickable
50 var sidebarEntry = "<div onclick='zoomTo(" + university.lat + "," +
1   university.lng + ")'>" +
50 "<img src='" + university.logo + "'><strong>" + university.name +
2   "</strong><ul><li>" +
50
3   university.programs.join("</li><li>") +
50
4   "</li></ul><a href='" + university.website + "'
   target='_blank'>Website</a></div>";
50
5
50
6   document.getElementById('sidebar').innerHTML += sidebarEntry;
50
7   });
50
8
50 // moves the map to a specific university when the sidebar entry is
9   clicked
51
0   window.zoomTo = function(lat, lng) {
51
1   map.setView([lat, lng], 13);
51
2   };
51
3   </script>
51
4
51
5   </body>

```

51
6

</html>

Administrative Document

The following is a list of files that can be found on the 'M: Drive' folder, which contains original code and access instructions for various platforms.

The files and folders can be found on the University of Edinburgh School of GeoSciences server in:

<\\students.geos.ed.ac.uk\s2606850\dissfinal>

Table: Contents of M: Drive

File Name	Contents Summary
access	Instructions for how to access various platforms used throughout the retrofit of Geospatial UK
surveys	Original data files of survey results for all four surveys
web_map	Original code written for the construction of the Leaflet web map, currently integrated with Geospatial UK