SEWeb
LIFE10-ENVUK-182
Action 25

SEWeb Website Visioning Project

Report produced by the University of Abertay Dundee for the SEWeb Website Visioning Project (SEWeb LIFE10-ENVUK-182 Action 25), April 2013

Contents

1 Executive Summary

This report has been developed for the Scotland's Environment Web (LIFE) project. Scotland's Environment Web shall be referred to as SEWeb throughout this report.

The findings of the report draws on the analysis of the SEWeb web site survey, a series of 5 stakeholder workshops that were run to identify how users of environmental access and interact with the information retrieved on SEWeb and other online sources , and the computing design and development expertise and research of Abertay University consultants. The aim of this report is to provide recommendations to the SEWeb (LIFE) Project on the future development opportunities of the web site and overall web presence so that it can be effective, useable and accessible to a clearly defined group of target users and provide a unique yet viable mechanism to deliver the objectives of the SEWeb (LIFE) project.

1.1 Background

Environmental information is a growing topic of interest among many different sectors of society. Through the media, established good business practice, statutory regulation, lifestyle choice, curriculum topics and academic research activity, the environment is increasingly being embedded in every aspect of daily life. This growing interest in the environment is creating a need for more environmental data and information for a wide range of purposes and users. As well as an increasing demand for data and information, there are key emerging drivers on the supply of "Open Data" and information into the public domain. This can be seen through strategic initiatives such as UK Government "Open Data White Paper" and the Scottish Government Scottish Public Services Digital Strategy.

SEWeb is a project supported by European LIFE funding, and of its 25 project actions and the current 70+ Products to be delivered by the project, by August 2015, the success of the project relies heavily on the SEWeb web site as a key delivery mechanism. It is therefore important for the project to design, develop and operate an appropriately focussed web site with a clearly defined user base in mind, and make use of appropriate existing and emerging web based technologies.

SEWeb has a number of aspirations which require specific knowledge of the target users and web tools and technologies to address namely SEWeb aims to;

- bring together environmental data and information from a variety of sources into one place, establishing itself as the gateway to everything you want to know about Scotland's environment
- bring together information on Scotland's environment so that it is easily available and in a useable form
- place Scotland at the global forefront of sharing environmental information, prioritising problems and involving the public in assessing and improving their own environment.
- develop a modern and dynamic approach to presenting information and data – moving away from static, published reports, to a web site where access to the most up-to-date environmental information is made available

There is a real opportunity for the SEWeb web site to position itself as the Trusted and Valued place to search for, find, access, view and interpret, all Scottish environmental Open Data, provided not only by the Scottish public sector, but a wide range of other Scottish data providers. The project can also establish itself as a best practice project for shared learning and knowledge exchange for other organisations who aspire to use Information and Communication Technologies to maximise the scope, reach and influence of data and information on policy making, decision making, and lifestyle choices. This report will help SEWeb find its Unique Selling Point, its niche role in an increasingly cluttered landscape of online environmental information and data.

1.2 Structure of Report

The Report is structured in 3 main sections:

- Review of the current SEWeb web site and users;
  This section covers the analysis of the web survey of the current SEWeb site, the environmental data use workshops and previous public research performed for the project.
- Options for the future of SEWeb;
  This section describes the types of users the website should target, the tools and technologies that could be used to access these users and how these tools can be incorporated into a greater web presence for SEWeb.
- Delivering a successful SEWeb website;
  This final section covers the SEWeb web site vision highlighting what directions the future development of the site should take. The main delivery recommendations are detailed here including possible measure of success to ensure the sites effectiveness.

These sections represent an empirical approach focused on knowing the user, combined with a reflective exercise of general vision of the SEWeb. It is the ultimate aim of this report to establish a series of best practices and potential solutions that successfully cover current user needs at the same time that new users are captivated by the utility of the found resources. A catalogue of novel and effective ways of interaction are suggested to be implemented in short, middle and long term.

1.3 Summary of Recommendations

1.3.1 Define site name, purpose and target users

There is currently no single identifiable name by which SEWeb is referred to by its users, developers and on the site itself where there are at least 4 different names used. Not only does

this lead to confusion among the visitors but also makes the site more difficult to remember and find. The web survey and workshops performed showed that currently SEWeb does not have a clearly identifiable purpose as far as the visitor is concerned. Whilst the recent site refresh has tried to alleviate this by providing a statement of purpose on the front page this still does not, for the users, represent a single identifiable purpose. Recommendations 4.4.1 & 4.4.2 suggest that SEWeb decide on a single name to be used publicly, which is memorable, identifiable and most importantly reflects the purpose of the site. One of the reasons for the lack of identifiable purpose and lack of knowledge about the sites is due to their being no clear target user group. Whilst no target group should be deliberately excluded, SEWeb need to concentrate its efforts on groups which will be most likely to use and benefit most from the site. Recommendation 4.4.5 suggests that SEWeb, at least in the short term, concentrates on the generalist users - including young people.

1.3.2 Embrace mobile and social technologies

The report identifies gaps in the web presence of associated with SEWeb. A fuller web presence will help the site spread awareness about itself and the issues surrounding Scotland's Environment. A part of this expansion of web presence will be the development of SEWeb across different devices and social networks. Recommendation 4.4.3 highlights the need for SEWeb to produce a mobile friendly site which will allows users to access the most important, local information while they are actually out in the environment. Recommendation 4.5.6 extends this to the development of Mobile apps which will allow further engagement with SEWeb, particularly in citizen science initiatives. Social networks could play a large part in spreading knowledge about the site and its purpose. SEWeb needs to develop its own presence on social networks to be able to make full use of this resource as suggested by recommendation 4.4.4, initially this should be developed for the most popular network, Facebook. Once established this process can later be extended to other networks (recommendation 4.6.2).

1.3.3 Provide environmental information that is trusted, current, understandable and easy to find

The workshops performed showed that it is very difficult for the general user to find trusted information about the environment. It is also difficult for general user to determine the currency of the information they do find. SEWeb already aims to be the gateway for information about Scotland's Environment. It is recommended that this aim be reinforced by SEWeb becoming a clearly trusted source for environmental information (recommendation 4.4.7). In combination with this SEWeb should ensure that the information provided should be current. As suggested in recommendation 4.4.6 SEWeb can use dynamic feeds from partners, social networks and news feeds.

The use of maps as an information source was raised by both the workshops and the site surveys. It is important to address the current issues with the mapping system to provide the functionality and control that the users want (recommendation 4.5.4). While the map helps users find geographic information SEWeb also needs to ensure that all the information on the site is

searchable regardless of the terminology used and that there are clear links between the information which makes it easy for a visitor to navigate (recommendation 4.5.1).

1.3.4 Provide effective data sharing capability

SEWeb can act as a trusted source for information for the generalist user. However it can also work as a conduit for supplying this information to other users trough data exchange and to software developers through an API system. To do share data effectively, recommendation 4.5.7 suggests the adoption of a standard data structure to allow all partners and other information providers to access the data in the same way. Adopting this standard data structure will allow much more automated methods of data sharing to be developed, including a data access API (recommendation 4.6.1) which will allow 3rd party developer access to the information provided by SEWeb and could also provide a revenue stream to fund future development.

1.3.5 Address user needs

One of the main reasons suggested in the surveys for visiting the site was to find information about how to get involved in and enjoy the environment, something SEWeb does not currently provide. Clearly this information can be used to encourage visitors to the site where they will also be exposed to the other information available (recommendation 4.5.9).

One of the aims of SEWeb is to provide the information in more engaging and interactive forms which will further entice users to the site and allow for better and easier navigation and data sourcing. Recommendation 4.5.3 presents some examples of where this has already been done on similar sites including interactive data mining and info graphics. Recommendation 4.6.3 follows on from this by highlighting public interest in getting more involved in the environment. SEWeb should engage users, particularly in Citizen Science, by collecting crowd sourced information about the environment and allowing user to upload their own data.

The information SEWeb provides is likely to be of interest to many different users. It has already been suggested SEWeb should initially concentrate on the generalist user however it is recommended (4.5.2) that eventually SEWeb should adopt a wider scope and support three main user types, generalist, specialist and youth/education. Part of this will be to produce information specific to the other users groups, including teaching and learning material (recommendation 4.5.8).

Finally it is recommended that SEWeb perform a full accessibility analysis of the site to ensure that there are no user experience issues for functionality impaired users.

2 Review of the current SEWeb web site and users

2.1 Analysis of SEWeb Web Site Survey

The following section describes the quantitative and qualitative analysis of the results of the SEWeb site survey. The survey captured existing web site users through targeted promotion within SEWeb partners and affiliated networks, however a high number of first time users views were also included. The results here are based on the SEWeb site prior to its user interface update in January 2013. The survey questions and a summary of all the results are available in the Annex of this report.

2.1.1 Quantitative Analysis of Survey Results

The survey provided valuable information about the users of the current SEWeb site. A series of observations were made based on the assumption that the sample that responded to the survey is a fair representation of the SEWeb current user base.

The predominant user group were the Public Sector, followed by the General Public. The groups with least participation were School and Media. The distribution of results (Table 1) reflects little awareness of SEWeb existence among Authorities, Industry, Schools and Media.

Table 1 Survey Percentage user group distribution

Group Description	Percentage
Public Sector	27.8%
General Public	17.6%
Third Sector	11.2%
Government	11.2%
Academia	10.7%
Local Authority	9.3%
Business/Industry	5.3%
School	0.5%
Media	0.5%

94% of the responding users had an age between 25-64 years, which does represent a good range even though the under 25s were largely absent. Looking at this further nearly 60% of respondents were from the 35-54 age group, showing a high proportion of middle aged users.

Only 2% of answers were from people not interested in the environment this clearly shows that the people that visited the site were interested in the environment and highlights the general interest in the environment issues. Most of the users (85%) stated that they wished to enjoy the environment, closely followed by understanding and protection. The main reasons to visit SEWeb were roughly: General interest, Data, Research and News and Events again clearly showing that the visitors were interested in either finding out, both specifically and generally, about the environment.

40% of the survey respondents heard about SEWeb by word of mouth/recommendation many of these respondents were first time visitors to the site. These results are partially explained by the promotion of the survey, mainly made through targeted emails, briefings and articles to partner organisation staff and networks, this is supported by the large proportion of Public Sector responses. Most of the respondents stated that they would return to the website (without explaining when or why) and recommend it. 25% of the respondents did not find what they were looking for, and only 10% viewed SEWeb as a unique source of environmental information.

The vast majority of respondents (85-90%) accessed the site by computer at work, and only 10-15% by mobile devices. This access is sufficiently Good from computers and close to Average in mobile devices. Mobile devices (phones and tablets) are currently the least used to find or search information; this would appear to go against the current trends in internet use which shows a dramatic rise in internet use via mobile devices.

The respondents suggested that their preferred way of receiving information was Email followed by Face To Face contact, then News and Journal Articles. Around 65% of the respondents used some form of Social Media; this is just above the UK figure of 62% of the online population. This would suggest that the respondents were already social media aware and would be used to this type of communication.

2.1.2 Qualitative Analysis of Survey results

In conjunction with the statistical information summarised above the survey also provided the respondents the opportunity to leave free form comments detailing how they felt about the site design and functionality. This section identifies and summarises the common themes across the user comments.

SEWeb purpose:

Some of the respondents suggested that the purpose of the site was not clear, that there was no direct message telling the visitor what the site was for. This made it hard for the respondents to recommend the site to others for a specific purpose.

Website name:

Respondents expressed dislike or apathy towards the name of the site. It is assumed that here they were referring to SEWeb, as it was named on the survey pages. It was suggested that the

name should represent the core concepts of SEWeb, be inspiring and be memorable and the current name fulfilled none if these requirements.

Content Currency & Relevance:

Respondents suggested that the information presented was not up to date, or that they could not determine when the information was produced. It was suggested that the information should be updated much more regularly to remain current and that the date of any updates should be made clear to the visitor. There was a desire for an up to date list of events, legislations and other environmental news items.

As well as the timeliness of the information the respondents expressed concern about how relevant the provided information was. Many suggested that they could not find any information that was not already available on other sites and that the information that was available was not as good or not as accessible as the information available elsewhere. The library was one section that the respondents did mention as being a good idea, but that the information contained in it was too generic.

However the respondents liked that the site seemed to present itself as a single source for environmental data, compiling data sources from across the different organisations. It was particularly noted that the information provided here was not usually accessible by the general public and that this was a welcome change, however it was noted that the content was mainly technically written. The range of comments here reflects the different way users of the site would like the data to be presented.

Navigation & Layout:

Many of the comments about the relevance of the information directly related to how reachable the provided information was. Respondents suggested that the information provided should be arranged more clearly, structured and organised so that it was much easier to find.

Some of the respondents noted that the site was not searchable on common search engines and that this would have made the information on the site much more accessible. The "what's in my back yard tool", where the user can search with their postcode, was particularly praised by many respondents, with only one person suggesting they could not get it to work.

Many respondents liked the layout of the site stating that it was easy to use and simple, however it was suggested by others that the layout and navigation made the information harder to find. Some respondents suggested a split approach were business, government and public users would access the site in different ways. However some also suggested that it looked too much like a government site and felt the site was too clinical in its presentation. The comments here suggest differences in the way the users want to access the data; the comments may also reflect specific usability issues with the sites navigation.

Map Functionality:

The functionality and usability of the map for finding geospatially related data was consistently mentioned throughout the comments. Many of the issues here relate to both the accessibility of the information provided by the site, the relevance of that information and its presentation.

Respondents suggested that the a number of issues surrounding the map could be improved, including the controls, the level of detail, loading speed and the ability to effectively filter the information being displayed. It was also suggest that the map was not suitable to any analytical purposes. Again the comments here reflect the different types of users, with expert invariably wanting the map to show analytical standard data and the non-experts wanting simple to understand location based information.

2.2 Current User Profile

Based on the information collected in the survey, an average representation of user demographic of the current SEWeb user profile would be:

A male of 48 years old from Edinburgh, who uses the website for work reasons and connects to the Internet from work. He discovered the website for the first time through his contacts in SEPA, who told him where to find some resources for his PC at work. As an advanced and frequent user of Internet, he visits SEWeb several times a month and overall finds it, at first glance, reasonably easy to use. However, one of the problems is that he finds some sections particularly difficult to navigate and he does not understand with what criteria they are arranged. 3 out of 4 times he finds what he is looking for, although not always in a quick or intuitive way. Only his experience in the website and the internet in general gives him a good chance to finally find what he wants. Another thing that frustrates him is when he has to search for new things, most of the time this takes him much longer than expected. When that happens, he wants to write an email suggesting some improvements on the website, but unfortunately he has been unable to find an easy way to contact the webpage administrator and he usually gives up. He wishes they could improve the Map (which not always shows the information he wants), Trends & Indicators and Life + Project pages. On average, he visits few pages in the SEWeb and he feels satisfied after the time spent, although he recognizes that it took him a while to get used to it.

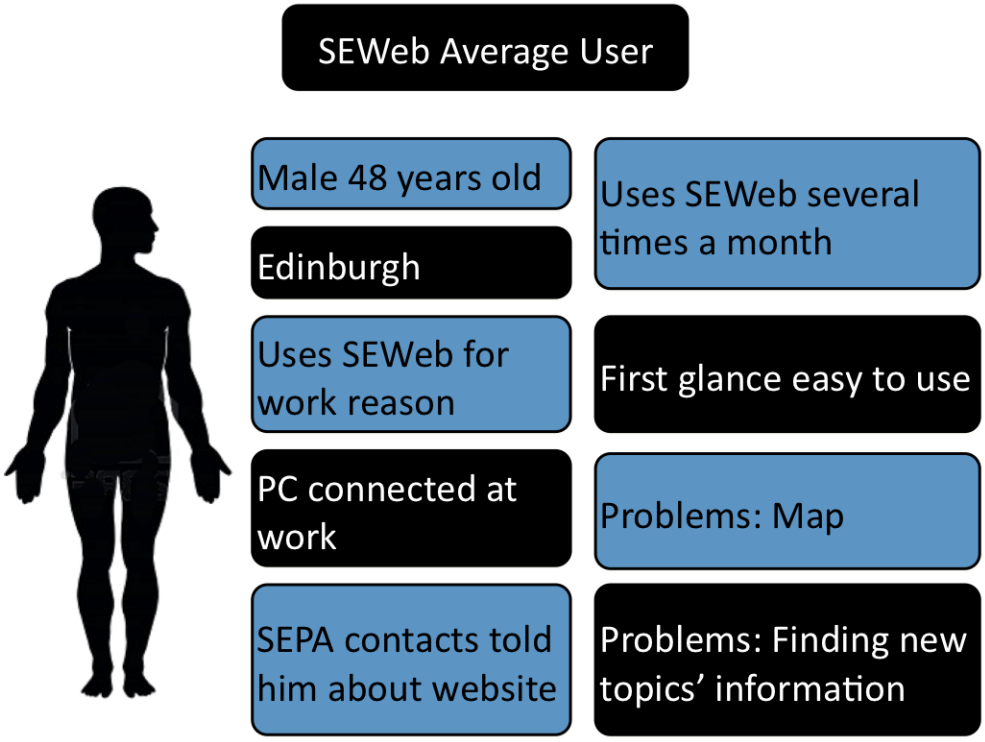


Figure 2.1 : The SEWeb Current User Profile based on average survey results

2.3 Environmental data use workshops

2.3.1 Workshop Rational

The rationale behind the workshops was to gain an understanding of how the potential users of the SEWeb site currently find and access web based environmental information. The workshops were designed to allow the researchers to see firsthand, through the use of practical scenarios, the how the participants actually found the data they were looking for. This included what types of other web sites they visited, what search techniques or engines they used and more importantly what hurdles they faced when performing these tasks. The use of mobile technologies in the workshop allowed the researchers to identify how the potential users felt about accessing the data in this way. Through the co-operative design session the researchers were able to understand the presentation and information management styles that the different users preferred.

The workshops were designed to find ways to take the SEWeb development in a direction that will provide the most benefit to its potential and current users. It was not the purpose of the workshops to identify problems with the current system.

There were three main objectives to the workshops:

- To gain an understanding of how potential users of the SEWeb site currently find the environmental data they need.

- To determine if there is an appetite among the potential users for a wider web presence for SEWeb including access through mobile devices.
- To investigate different user type preferences for web information portal design.

2.3.2 Workshop Structure

Each of the groups was given one scenario at a time where they needed to look for specific pieces of environmental information on the web. The information they required was available on SEWeb or on one of the partner organisations websites. The goal of this session was to gain an insight into how and where the participants currently looked for data using computers (laptops were provided) and any common problems they had accessing the data they needed to find. To determine what kind of mobile access the stakeholders would like to have for environmental information, the last scenario looked at the current state of data accessibility via mobile technologies. Participating groups were supplied with an iPad or Android tablet, and often used their own mobile phone devices, and asked to find a specific piece of environmental information, again available on the current SEWeb site or partner organisations.

Once the participants had completed the scenarios they would have a focused understanding of the issues they faced when accessing environmental information. The co-design session which followed provided the participants with an opportunity to design how they would like to have the environmental information presented to overcome these issues. Using physical props the groups were able to build up a webpage, which represented how they would like to access and layout the data they needed, what sections an information portal page should have had and how they would have liked to navigate such a page.

2.3.3 Composition of workshops

There were 5 workshops performed during the study, this encompassed approximately 80 participants of varied backgrounds.

Workshop 1 - Perth

The participants at this works shop represented a range of environmental data users including public sector employees, local government, academic, a Science and Technology coordinator, an environmental photographer , a European project officer and a PhD student in environmental issues.

Workshop 2 - COSLA Edinburgh

Participants at this workshop were mainly public sector and local government.

Workshop 3 and Workshop 4 - Abertay Dundee

Both these workshops had a mix of academics, students, community workers and representatives from local government including an engineers and biodiversity officer.

Workshop 5 – Thistle Hotel Glasgow

As this workshop was ran in conjunction with an Education Scotland event with most of the participants from a teaching background, although there were also representatives from environmental public sector organisations with and Environmental Education background.

2.3.4 Main findings of workshops

The workshop scenarios provided a real insight in how the users of the current SEWeb site access and use the data. The elaboration of the following list with the main findings was made thanks to the valuable comments and suggestions collected at the workshops. In addition, the Co-Design session enriched the design possibilities with a better perspective of what information structures, contents and ways of accessing it users are willing to find when they search for environmental information, and what sort of main categories are intuitive for them.

Site Name

It was evident from the workshops that many of the participants had not heard of or seen the site until they were asked to perform the SEWeb website survey before attending the workshop. During the workshops only those participants who had had involvement in the current SEWeb website creation attempted to use the site to source the required information for the scenarios. This was mainly a result of the user not being able to find the site efficiently through Google and other popular search engines (e.g., Bing) when certain search terms were entered. Some of those participants that did not complete the online survey prior to the workshop attendance did not know what site was being referred to until they were shown the "SEWeb" site during the workshop.

It can be seen from these observations that there is an underlying issue of the site not being recognised, either by human users or by search engines. The main reason for this is that the site owns clear lack of identity. Figure 2.2 shows the site's Home page (SEWeb Homepage, 2013) on this page alone there are four different names for the site.

- environment.scotland.gov.uk
- Scotland's Environment
- Scotland's Environment Web
- SEWeb

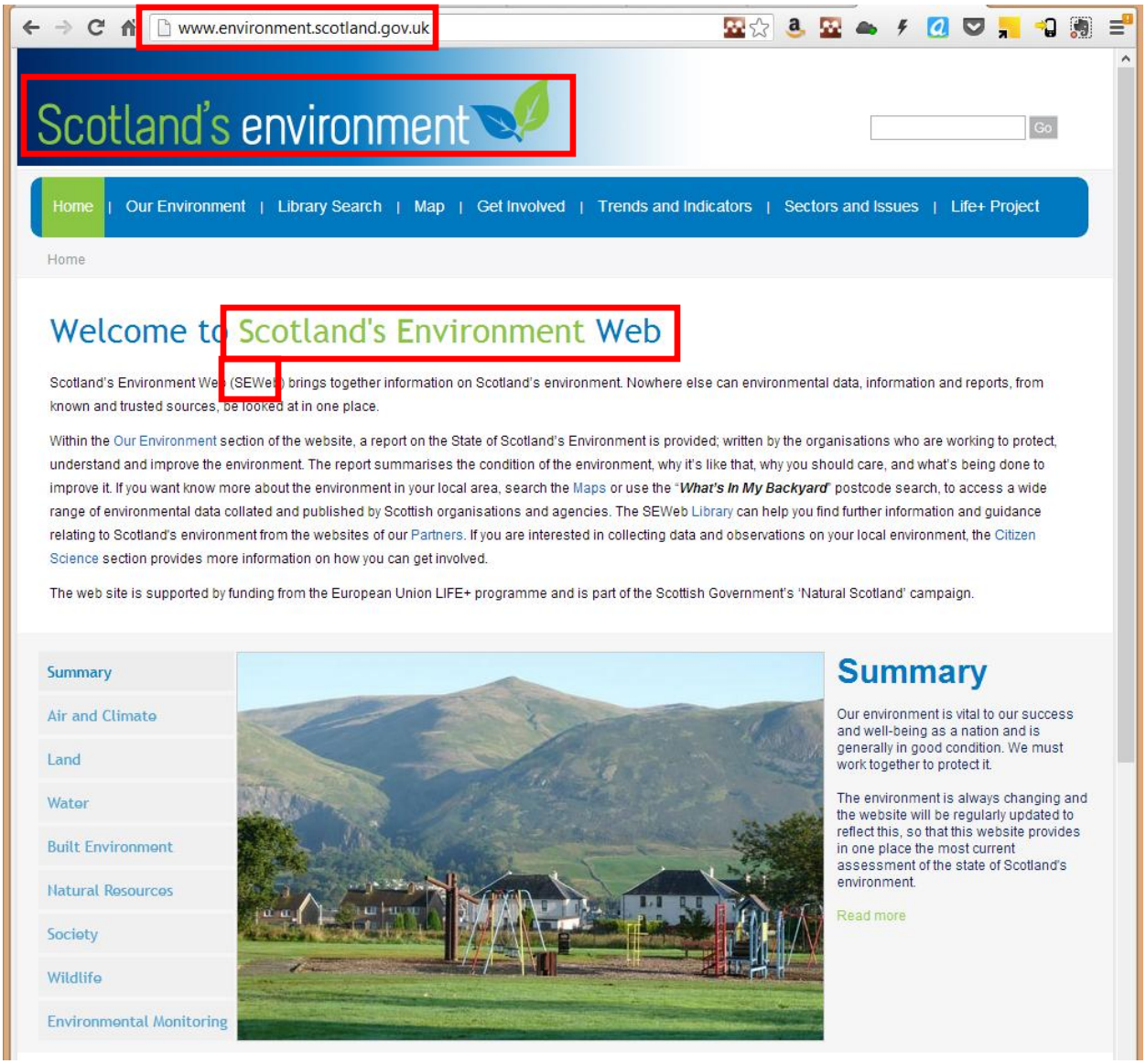


Figure 2.2 : SEWeb Home Page

It is assumed here that the purpose of the site to promote Scotland's Environment, as this is one of the key aims of the overall project. As such it should be the Scotland's Environment "brand" that is pushed to the forefront and not SEWeb itself. It is understandable that a shorter name is adopted during planning and development and this is common practice during software development, however once the site is finished this codename should have been dropped, at least for all external, public facing usage. It can be argued that well known brands have arisen using acronyms, examples include the BBC (British Broadcasting Corporation), HP (Hewlett Packard) and IBM (International Business Machines). However all of these organisations were well known before the shortened name was adopted for general use. The use of different terms in referring to the site at this stage reinforces the confusion about the site identity and as stated by the site survey respondents and the workshop participants the name of the site must be memorable and inspiring.

Site Purpose

Another aspect looked at in the workshop was what the purpose of the SEWeb site should be. Site users at the workshops and in the survey showed confusion about what the site was for and who ran it. Many of the workshop participant's did not know whether SEWeb was actually a separate site from SEPA, although this could have simply been because they were invited to the workshop by a SEPA employee or a via a SEPA email address. However the recent update of the site (January 2013) seems to have improved this situation and there is now a clear introduction to the site, its main purpose and that of the individual sections.

The workshop participants suggested that if they already knew where to find information they would use these specific sites and not SEWeb. These users are unlikely to be SEWeb's target audience as they have already identified how they will find the data they are looking for. There was very little use of SEWeb as a first port of call for any of the scenarios, even for those that knew about and used SEWeb. To them, the site ultimately provides little additional value for specific/technical information searches.

During the workshops it was highlighted by users that many of the links on the front page of SEWeb immediately take the user away from the site to information stored somewhere else. When combined with the identified user search paths, discussed later, these users would most probably have found this information more quickly through a simple web search. When searching for the information on SEWeb via a web search, the results will normally come far below that of the original hosting site in search engine results. The example in Figure 2.3 shows a web search for "Scotland incinerator sites". As can be seen SEWeb does not appear in the first page of results even though the site provides map information of all incinerators in Scotland.

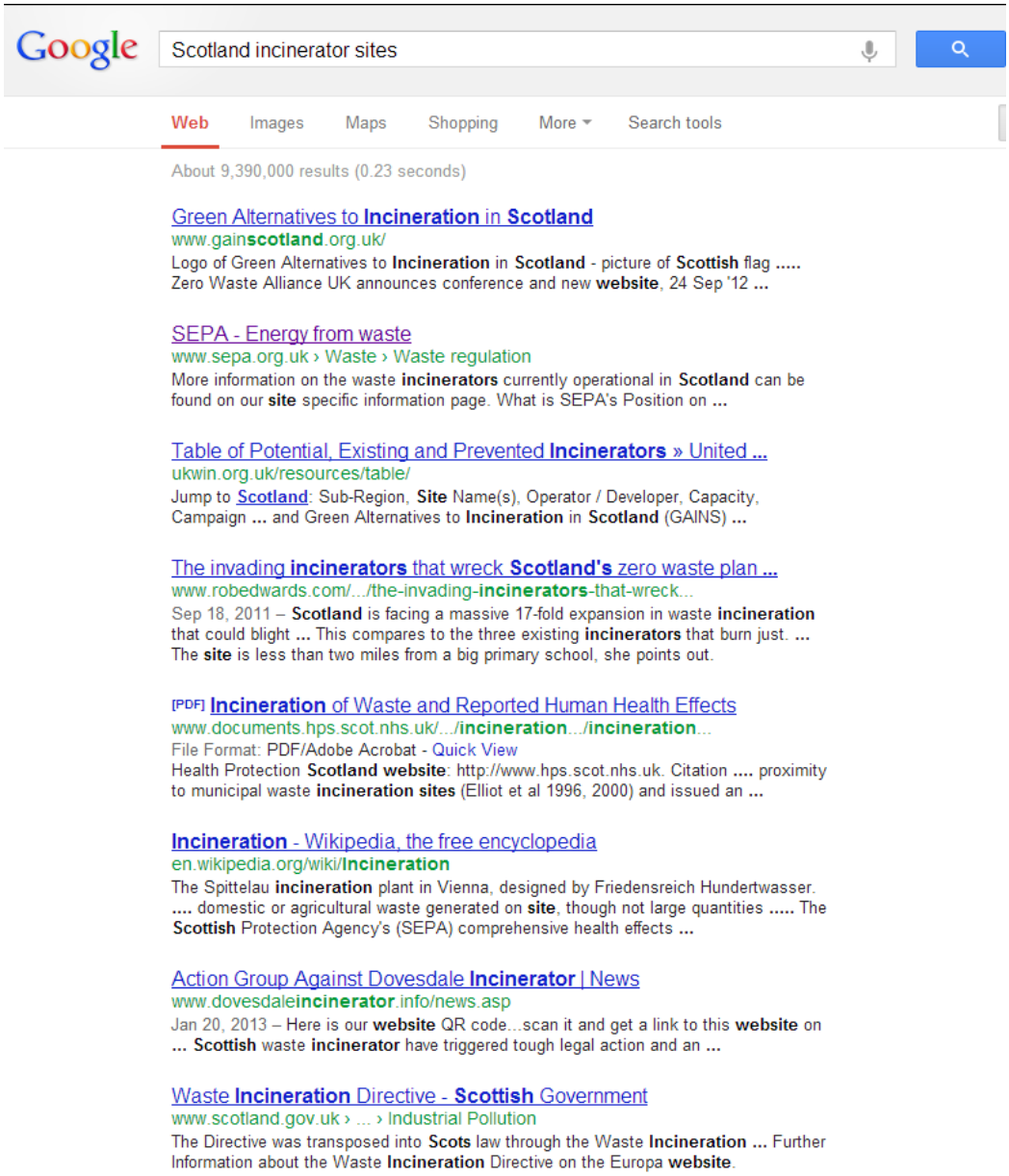


Figure 2.3 : Google search for "Scotland incinerator sites" showing no first page results for SEWeb

This again highlights that SEWeb, currently provides little benefit for those looking for specific information. Although at first glance these findings may appear negative, when the workshop participants were asked what they thought the site should be it was clear that they felt that it should provide more general, easy to digest information primarily aimed at non-experts. Providing the information in a more general way would compliment, and not replace, the specific information available on other more technical sites. By providing a direct link between a simplified explanation and presentation/visualisation "window" on the SEWeb website and more detailed and often complex/scientific data and information hosted by other organisations, SEWeb could provide a valuable environmental data search and access service.

This also fits well with the aim for SEWeb to be the "gateway to everything you want to know about Scotland's environment" (Site Vision March 2011)

Trust

The issue of trust was a common theme across all of the workshops. Whilst looking for the information for the scenarios the participants came across a number of sites, which purported to contain the information they were looking for. However many of these sites were either media and news sites or websites of groups who were advocates for or against a particular issue. The participants expressed concern about how trustworthy and unbiased the information they were finding was. This would not have such as impact on expert users as they would already know where to find the data on sites that they presumably trusted. Non-expert users or users looking for information out with their particular field would not be able to use such prior knowledge and so would not be sure the information they would be accessing is trustworthy.

When searching for particular information about the scenarios given, participants found that news sites, such as BBC and Google news, usually contained the most up to date information. This would be expected as that is the remit of these particular sites. Again though the participants expressed that these sites could contain at biased or more likely sensationalised information and would not therefore be completely reliable sources. It was also noted that a lot of official information on the same subjects and issues being investigated in the scenarios were last updated some time ago, this was across a range of sites, not just on SEWeb. This again leads to the users lacking trust in the sites information as they may now be out of date and no longer relevant due to new data, which is not always available.

Trust is one area where SEWeb has the opportunity to fulfil a purpose that, currently, is not filled by any other environmental website. The participants felt that by SEWeb could provide a trusted source of information and/or be a portal to trusted sources, assuring the data is up to date. This would allow non-expert users to trust the data they were accessing and have a time reference of the update of the information.

Terminology

Two issues surrounding the use of terminology on environmental websites arose during the workshop. These issues were found on many websites and were not solely related to SEWeb. The first issue involves the terms used when searching for information. As the user search paths show (User Pathways, p20) many uses will initially Google a specific term they believe relates to what information they are looking for, a process usually described as “fishing”. During the workshop it was evident that some of the participants had more problems finding the information for the scenarios than others.

The problems occurred when Google was not returning adequate results because the search terms the groups were using did not match the technical concepts used in the information. For example, one group had problems finding information about waste incineration, because they were searching for terms including rubbish. Even those workshop participants who were from a scientific background or had at least some basic environmental knowledge, found that terminology use still caused an issue in the search terms. It is not hard to surmise that when the members of the public, who may not have any basic knowledge of the environment, use search engines to find information the terminology used by the environmental website will have a much greater impact.

This links strongly to the second issue surrounding the use of expert terminology on environmental websites aimed at the public audience. The workshop participants, especially those looking for teaching resources, felt that much of the terminology used would prevent the general user, not only form finding the information, but from understanding it. The main issue here is that many environmental websites will be prepared based on content provided by experts in the area and as such will contain the "correct" terminology. Non-expert users are then more likely to source information from other non-scientific sites, such as Wikipedia, or media/news sites, such as the BBC and Google, or most worryingly biased advocate sites based on pseudo-science rather than real scientific information.

Again using the example of Scotland's incinerator sites, once the visitor has found SEWeb and attempts to use the map feature they are hampered by the terminology used by the map layers.

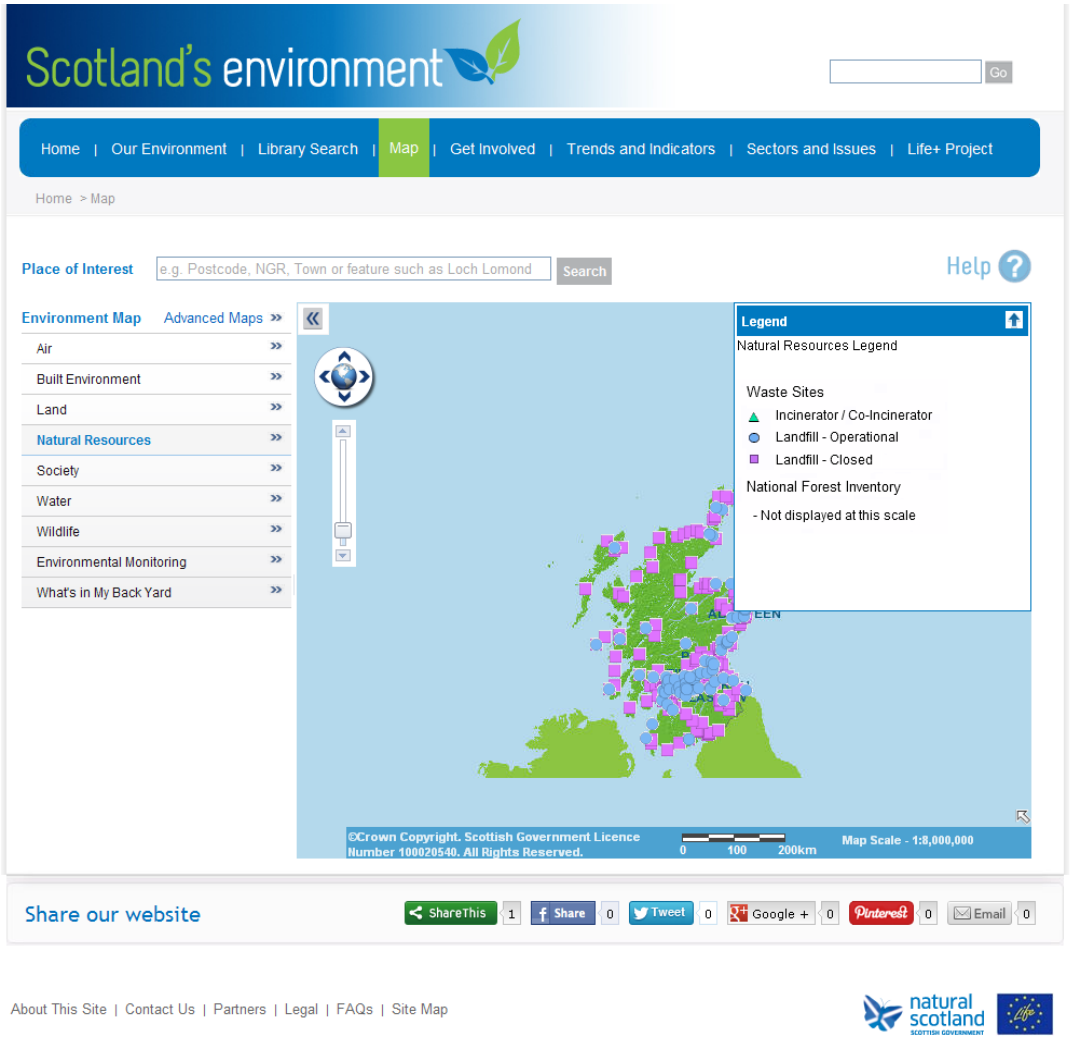


Figure 2.4 : Poor map navigation for generalist users

Incinerators are listed on the map under main headings of "Society", "Natural resources" and "waste sites". This is confusing to the generalist user who may not have the prior knowledge to look under "society" or "natural resources" as this may have little meaning to them and generally people think of "waste sites" as dumps or landfills. The map assumes that you're read the

relevant “Our Environment Section” which explains the terminology used, however a lot of users will just go straight to the maps. There are links from the pages containing the information (e.g. “Our Environment”) to the maps but not vice versa, this leaves the user unable to easily backtrack to an explanation of the information they are looking at this highlights the feedback given on the sites navigation in section 2.1.2.

SEWeb has a clear opportunity here to provide understandable data to the target users. Whether this replaces the information already present or is provided as an alternative. This will also clearly help the site meet its objective of providing a better understanding of the environment, both through the information being accessible via search engines and also through allowing non-expert users to understand the concepts and issues being presented. Automatic summarisation (part of Natural Language Processing) could be used to provide this functionality in a similar way to applications like Summly (http://summly.com/) which summarises news articles.

Maps

The map was one of the most distinctive elements of the Co-Design stage of the workshops (Section 2.3.5). The participants expressed that a map based display would be the cornerstone of any good environmental website, including SEWeb, some even suggested that the map page should replace the home page. It was clear from the workshop that the functionality, information displayed and overall layout that the participants wanted would be similar to other online interactive maps they had used (e.g., Google Maps). It was however acknowledged by the participants that a mapping system would need to provide particular bespoke functionality to allow the desired access to environmental information.

Four main topics where extracted from the experience attendees had during the workshops, in particular in the scenarios they used Internet maps and in the Co-Design sessions where an ideal map was designed

1. Structure of Information Content

Attendees wanted to have access to the information that was clearly comprehensibly distributed. For example, grouping information by Environmental topic such as Land, Water and Air and by functional use of data such as availability of natural resources, rainfall and number of daylight hours records; but also across different categories, like environmental protected areas, risks (e.g., contamination), prospective building or works sites, near transport connections or road traffic.

2. Granularity of the Information Visualisation

The granularity of the information refers to what level of detail is shown, for example when the map if fully zoomed out only an overview should be shown which can become more detailed as the map is zoomed in. The number of elements or information points shown on the map at any time should be optimal, determined by the zoom level, to let the user easily find the information. There is commonly an overload of information displayed, that distracts, overlaps or makes difficult for the user to find what is looked for. Figure 2.5 shows an example of poor granularity of information, where the map has been completely obscured by the data points being shown.

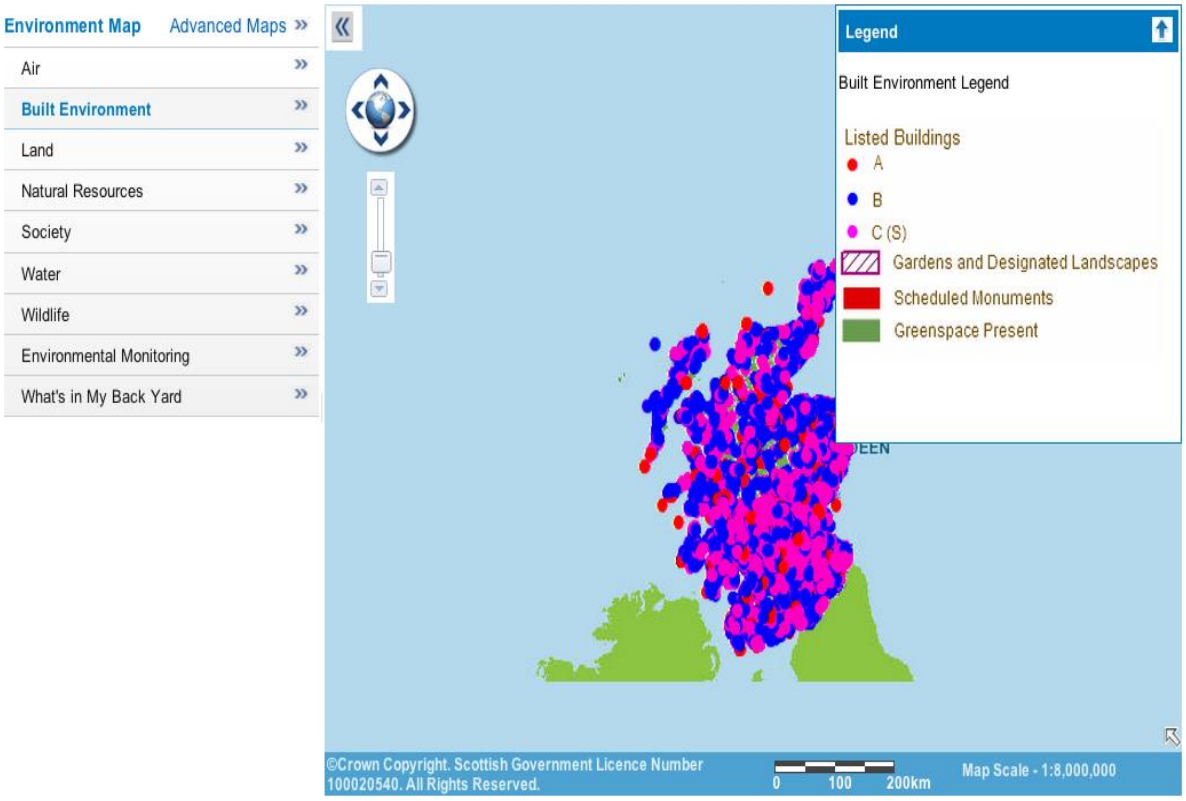


Figure 2.5 : Map image showing poor granularity of information.

The participants suggested that granularity of the information displayed should be customised by the user, having a default option adapted to the information searched. In actual fact the advanced option on the site's map already provides some of this functionality, this clearly was not obvious to the users. Even using the advanced features it is not possible to fully customise the information being shown. Figure 2.6 for example shows the listed buildings in a small town, although the advanced features lets the user turn off aspects such as "wreck sites" and "conservation areas" there is no way for the user to filter the listed building types and as such the map is still obscured. The user is forced to zoom in and thus change the scale they wanted to view the information at.

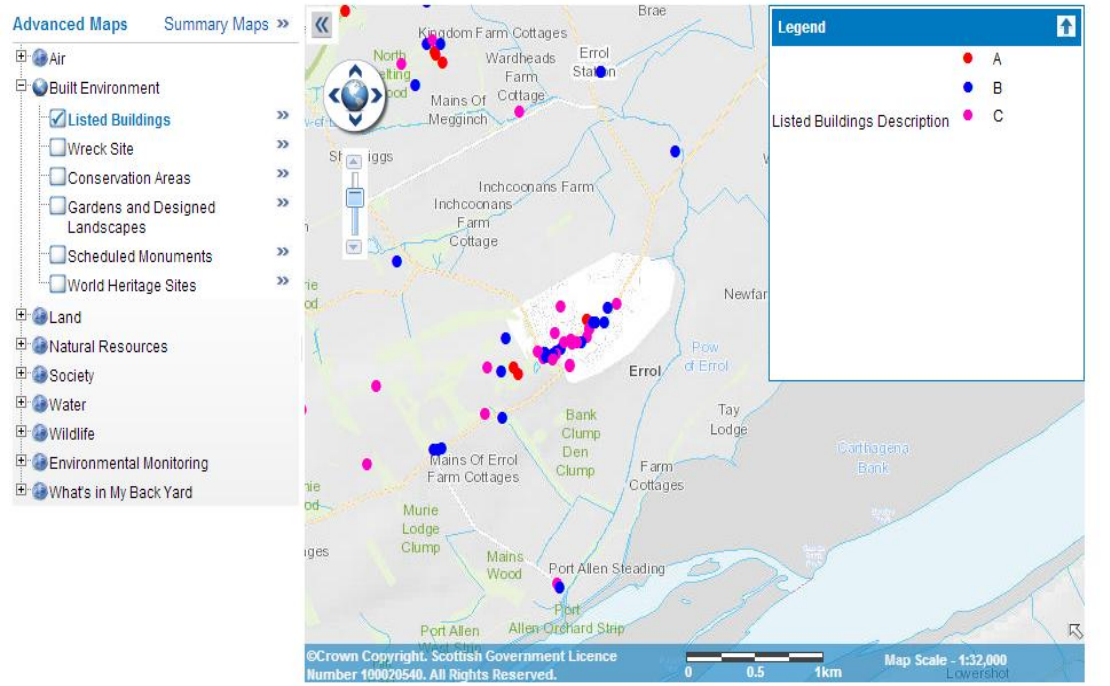


Figure 2.6 : Map system highlighting lack of data interaction

It was also suggested that the system should be able to automatically detect the device the user is accessing from (e.g., PC, mobile device) to consequently adapt to the specific device screen size the format and the number of elements shown.

3. Search Filtering

The workshop highlighted that there seems to be a general deficiency when search functions are coupled to the maps. Usually web searching is more efficient, favouring fishing techniques where users will initially Google a specific term they believe relates to the information they are looking for, searching visual elements from search engines instead through maps. Consequently the search function on maps should be as efficient as any other in the webpage.

4. Map elements interactivity

The workshop participants expressed a number of problems they faced when having to interact, reuse or share the information shown on the map. Users wanted to have a visual perception of what is, was or will affect certain areas and to be able to fully interact with this. At the same time they wanted the map to provide useful data that could be compared, analysed or shared. Users were only able to share information on many of the current mapping systems by taking screen shots; user expressed a wish that this process should be made easier. Some users also expressed a desire to be able to down load the actual data behind the maps and to be able to append their own data to it. It seems it is the adjustable granularity of the displayed information, the range of interactivity with what it is displayed and the possibilities of using it what makes a map useful for users.

User Pathways

During the workshops it was observed a search behaviour pattern in the attendees during the scenarios session. Overall there were two different patterns. One corresponded to non-specialist users, those who were not acquainted with the topic or the websites containing the solutions, who started their search from a search engine web page (e.g. Google), and trying to find the solution exploring the results one by one. If the first one was not successful, the user went back to the search result pages and advanced to the next (fishing technique). This technique concentrated the search results as the starting point of any exploration. Therefore, connections between SEWeb partners were not explored due to their unfamiliarity. The other behaviour pattern was carried out by the specialist users, those who were very familiar with the topic and/or with the websites containing the solutions. In this case, the search was performed selecting straight away the potential source of the solution, based for example on their experience of previously navigating the sources. Thus, they straight away typed the Internet address of the site or visited through Google. This allowed the navigation between SEWeb partners knowing where to find suitable sources.

In summary, these two search strategies were opposite in their behaviour and efficiency. Those groups who were satisfied with the found information were first visiting sites they expected to hold the information or at least provide links to sites that would. Those groups that were not satisfied with the information they were finding were usually employing this fishing technique to find the data via Google. The non-specialist user search lacked of any strategy, relying on a blind-search from the main search engine. In contrast, the specialist user search was guided by their experience in the topic and/or the website.

Personalisation

Many of the workshop participants expressed a wish to Personalisation or saving of favourite data/information searches, this included searches both on the map and information /data accessed within the sites main content. This would mean that registered visitors would not need to research for the information but it would be available to them as soon as they accessed the site and they would be able to get directly back to where the information was located. This would make it easier and quicker to access data each time the site is visited. This functionality could be achieved using a cookie system where the state of the site is saved to the user's browser; this would require express permission from the user to save the data and would only persist on a single machine. To enable this level of personalisation across devices SEWeb would require a sophisticated authorisation system where each visitor would have an account and the state of the site and the visitors searches would be saved to this account.

2.3.5 Results of Co-Design Sessions

The co-design session allowed the participants to design how they would like to have the environmental information presented. Using physical props the groups were asked to build up a design of a possible "home" page and a "map" page.

Figure 2.7: Co-Design workshops with Adults and Young People

These pages were selected in particular due to their importance indentified from the current site survey. The same process was performed across the workshops and with a group of Young People (Figure 2.7). The following section includes images of the created designs followed by a description of each design.

Home Page Designs

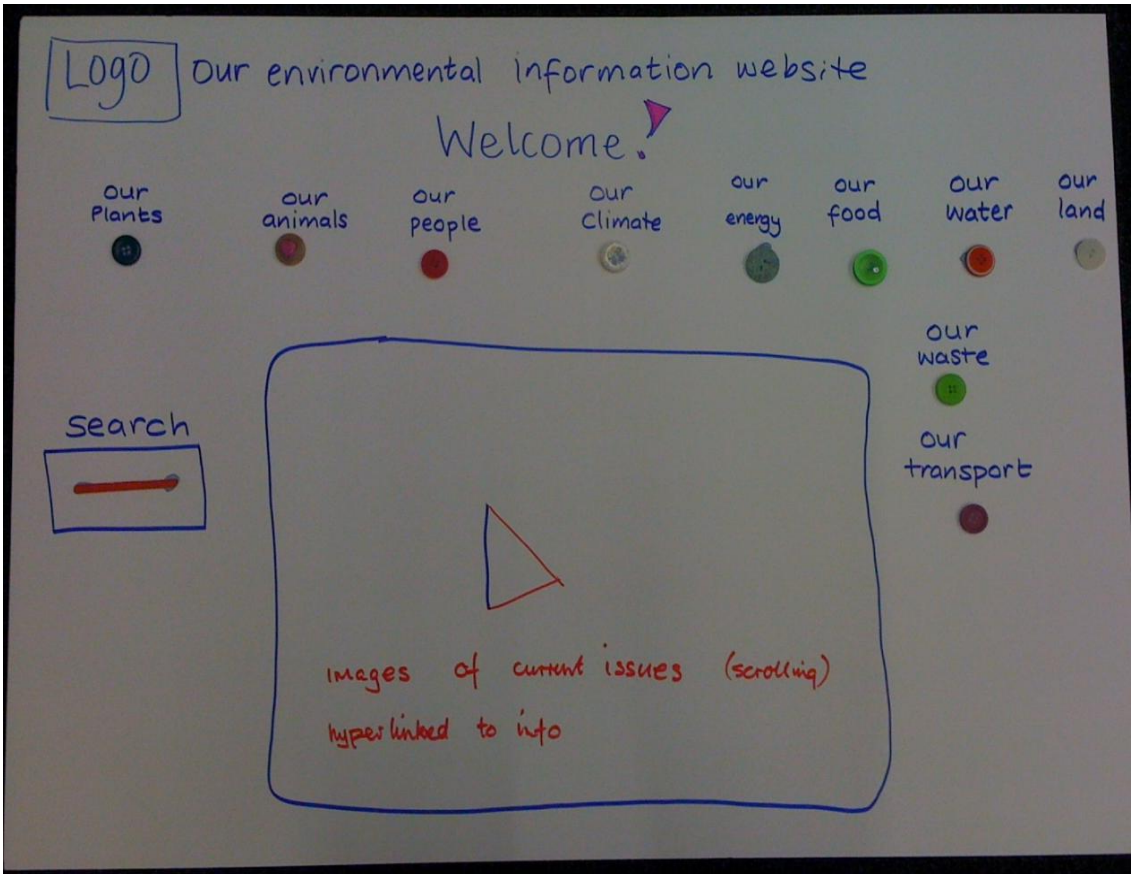


Figure 2.8 : Home Page Design 1

This design focuses on a very simple, almost minimalist structure. The sites sections are listed across the top and are all termed as “our”.

Figure 2.9 : Home Page Design 2

This design presents a much more cluttered home page with a wide array of links on the home page taking the user directly to specific aspects covered by the site. Direct links for aspects such as policy, research and data are clearly visible on the page. The map also seems to be an integral aspect of this page being positioned centrally. Standard features such as search and contact us are placed at the top right hand side, social media features with a simple link in the bottom right. Along the bottom the designers have placed links to answer questions site user might have, e.g. FAQ, Who does what?

Figure 2.10 : Home Page Design 3

Design 3 look much more like a traditional website, similar to the layout of sites like the BBC using clear content boxes. Again the map is prominent, however updates, latest news and images feature heavily. The headings largely match the existing site as does the footer bar with the partner logos and other links.

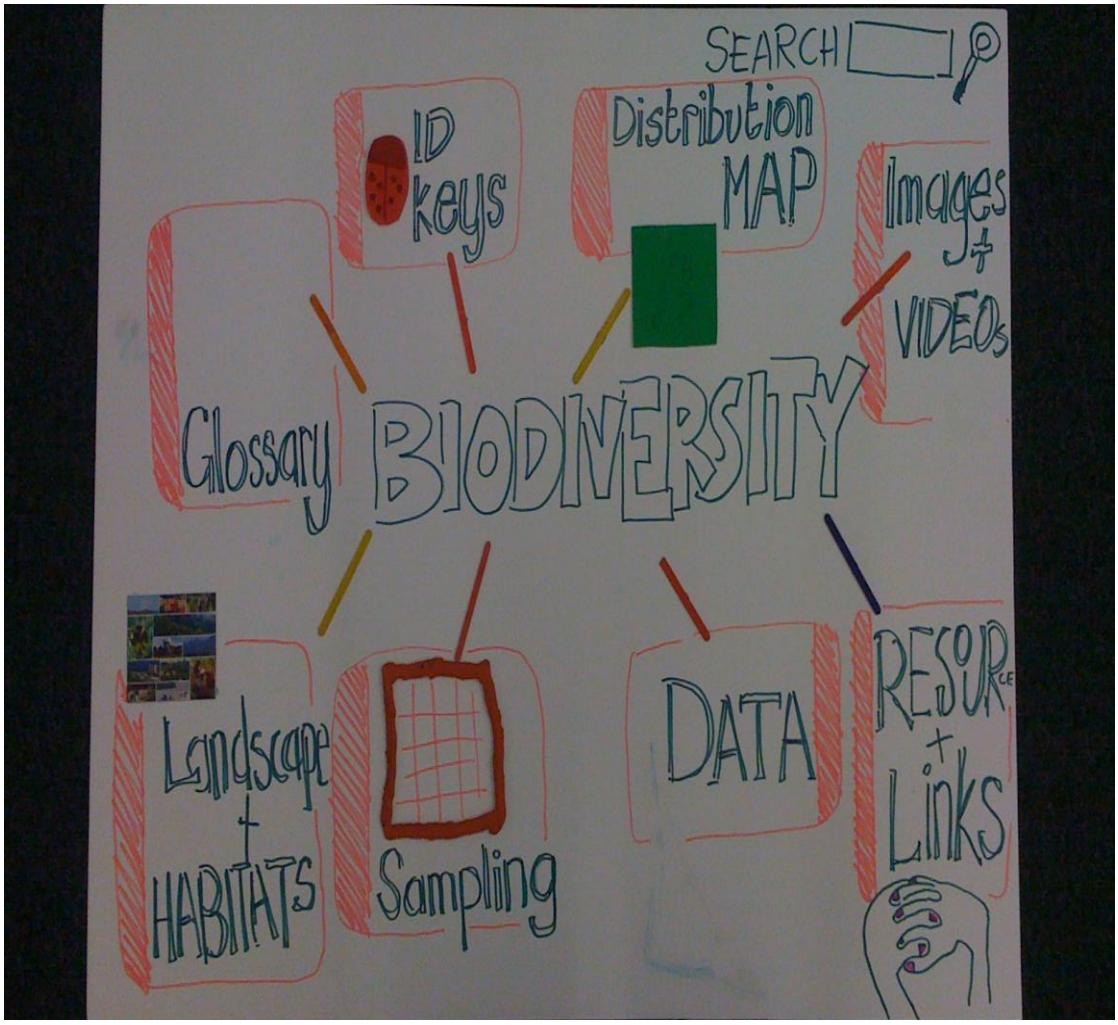


Figure 2.11 : Home Page Design 4

The design here is much more radical, there is very little text with the links to the sub-pages being represented with simple terms and images. This would make a good design for a youth /education site, but may not be suitable for the main home page.

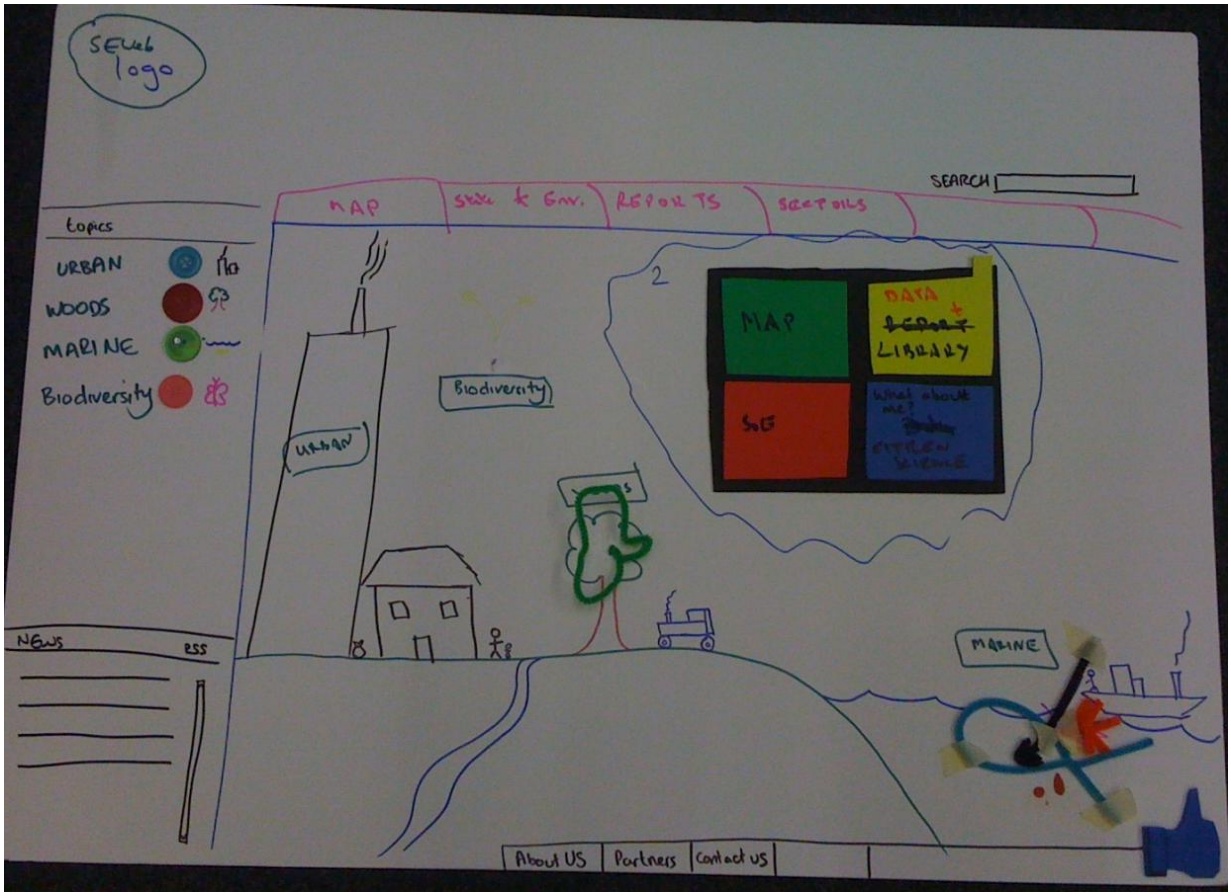


Figure 2.12 : Home Page Design 5

Design 5 combines a number of aspects which could be provided by the home page. The site navigation is largely via a large image central image which contains representative links to other sections of the site. This would seem to be an easily accessible navigation system for a generalist. A list of topics down the left hand side provides more specific information for those who know what they are looking for. Standard navigation bar and footer are largely what is already present on the current site.

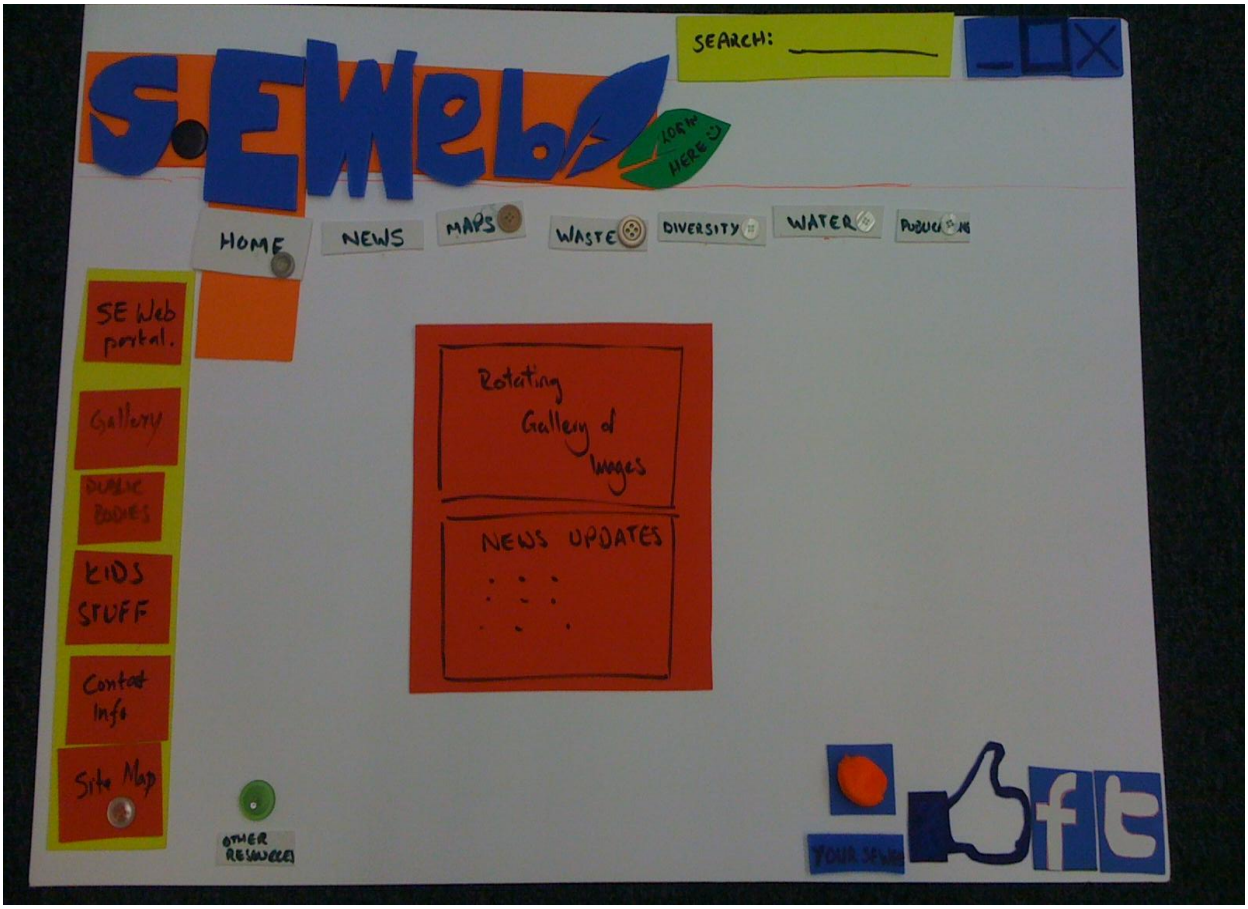


Figure 2.13 : Home Page Design 6

Design 6 presents a clean well defined site with clear links to sub sections. The page focuses on a central rotating gallery of images with cycling updated news items below. Specific navigation is via topic in a horizontal navigation bar, where as generalist navigation is via a vertical bar on the left hand side. Social media seems to be important here with large logs on the bottom right hand corner.

Map Page Designs

Unlike the Home page designs which all present different presentation styles and techniques all with their own particular merit and purpose, the map page designs presented a much more coherent idea. All the images presented the same core idea with a central map taking up nearly the whole screen. Data to be show on the map is then selected via links surrounding the map. Essentially this is similar to the mapping system already in place on SEWeb with the main difference being the layout of the layer selection and the fact that maps fills the screen. Only design 3 suggests novel functionality for different users where there is a clear definition between "What" data should be shown and "Where" this data should relate to and this is an aspect which could be incorporated into the suggested new mapping system for SEWeb.

Figure 2.14 : Map Page Design 1

Figure 2.15 : Map Page Design 2

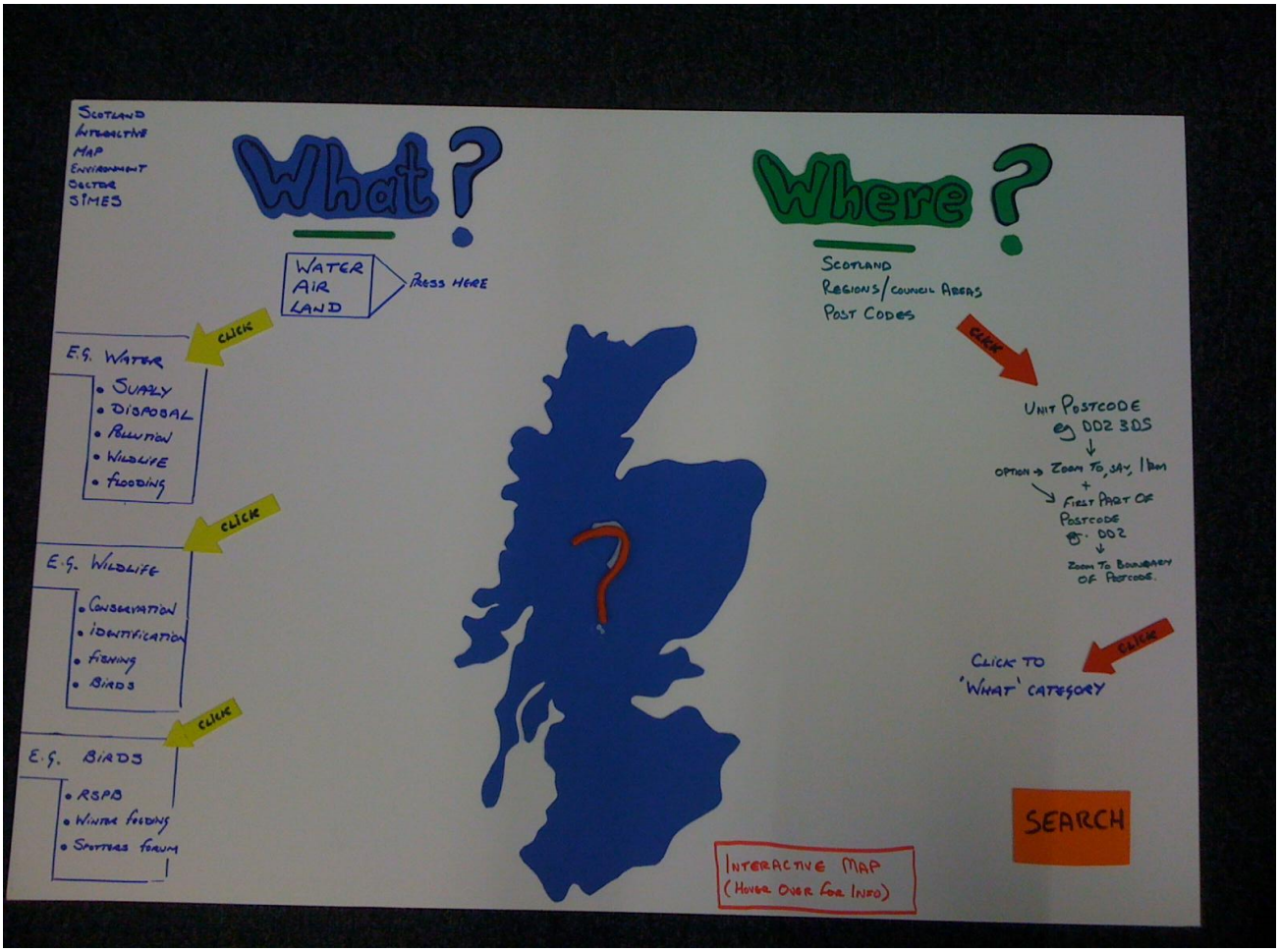


Figure 2.16 : Map Page Design 3

Figure 2.17 : Map Page Design 4

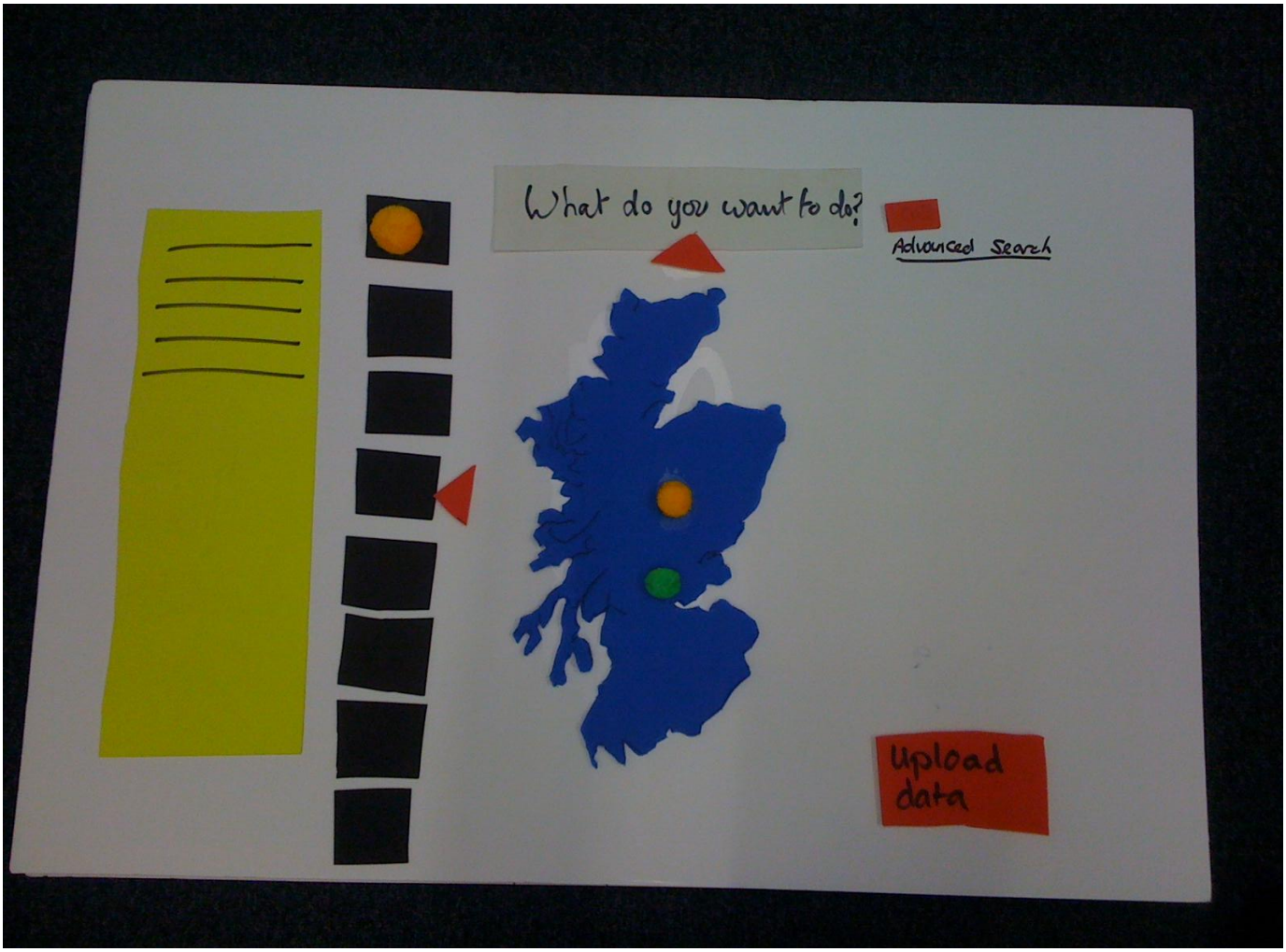


Figure 2.18 : Map Page Design 5

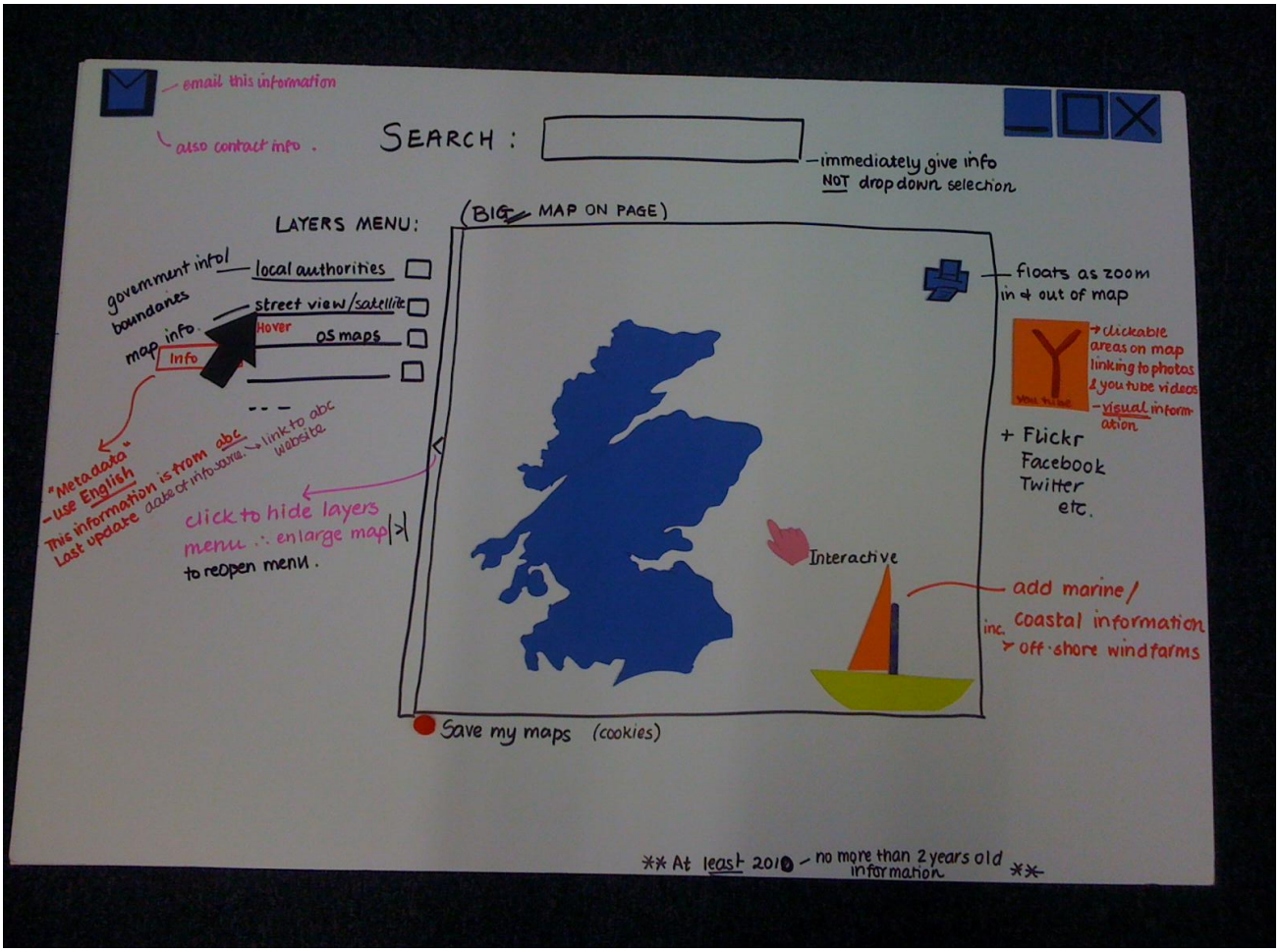


Figure 2.19 : Map Page Design 6

2.4 Previous public web user research

SEWeb has a clear objective "*to engage the public by providing access to high quality on-line interactive resources to promote better understanding of the environment, public debate on environmental priorities, public monitoring of the environment and public activity to protect and improve the environment".* Research was undertaken for SEWeb by Ipsos Mori (2012) to determine the desire for and the desired content of the current SEWeb site.

The research showed that there was clear public interest in the site and for the SEWeb project in general. People did want more information about what their own impacts were on the environment and access to information on the environment in general. They like that facts were given about the environment and especially as it was felt that this type of information was not usually available to the public.

People were more interested in environmental impacts in their local environment this reinforces the workshop findings that the "What's In My Back Yard" (WIMBY) tool was viewed as very

beneficial and worthwhile. This interest in local environmental issues suggests that SEWeb website content should be adapted or extended to provide information on local environmental issues.

It was identified that there are opportunities for SEWeb to provide better linkages between pages within the site and with links to other partner web sites and information sources. These feeling were also strongly evident in the survey and workshops on navigation and links between information and data throughout the web site. Users did not want to continually be redirected around what they were looking for, but wanted quick and easy access to the information they wanted, highlighting the opportunity of SEWeb to be an information gateway explaining and presenting information in a simplified form.

There was a clear expression that reasons for users to visit and remain on the SEWeb website should be clear. Essentially “hooks” which will keep visitors engaged. It was suggested that this could include descriptions of activities which could be enjoyed in the environment and other ways in which visitors could get involved in the environment. This was supported by the high percentage of responses on the website survey being from people wanting to enjoy the environment, however at the minute there is no info in SEWeb aimed at people wishing to enjoy the environment. This idea was extended to access to the site by younger users, where it was suggested that games, videos and other interactive media could be used as a hook to engage this receptive audience.

3 Options for the future of SEWeb

3.1 Target Users

Environmental information is accessed by a wide range of users from a variety of backgrounds for both professional and personal uses. The SEWeb (LIFE) project sets outs its main audience as the Scottish Public, Scottish Policy Makers, Environmental regulators throughout the EU, European Policy Makers, European Public, European Science Base (academic and industrial researchers), Schools and Academics. SEWeb clearly has to identify how to address the needs of these users or if it is to focus on a specific set of users. The previous website vision (March 2011) focused on a narrower range of users, the General Public and Communities, Government and the Public Sector, Schools, Academic Institutions, Developers, Decision Makers and Environmental Impact Assessors. This clearly still presents a huge challenge in addressing the range of data and information requirements, and providing this in a suitable form for all the users. SEWeb has to have a clearly defined user base to define how the information provided will be presented. Too broad a user base will lead to confusion, lack of focus and purpose, and will ultimately lead to the site not being used by any of the target groups, which has been shown to be an issue with the current site. The following section presents reasons for focusing on different user groups.

3.1.1 User Age

The age of a user will have an impact on how they view and intend to use the information provided by the site and ultimately whether the information provided will change their view of and behaviour towards Scotland's Environment. If the website survey is taken to be a representative cross-section of the visitors to the current site that there seems to a bias towards middle aged users (60% above 35). This age group is likely to already have a defined mindset and routine around their involvement with the environment and while better access to environmental information may help them understand or engage with environmental issues, it is unlikely that this will result in significant changes in behaviour. The importance of young users is critical because they are likely to be the users more susceptible to behavioural change and the use of the internet/social media to find and share information,

Through environmental education initiatives over that last 30 years there has been a rise in environmental topics in the education curriculum. This has subsequently resulted in an increased interest in the environment by younger users, who are already aware that the environment must be protected as it will be their own generation which could suffer the consequences. The SEWeb project has already worked with school children (Stirling High School) and Teachers (Education Scotland Workshops) to identify the SEWeb opportunity and added value that the project can provide to enhance and support environmental education in Scotland, in particular, building on citizen science and outdoor learning initiatives, and supporting the Learning for Sustainability Agenda.

There are already a significant number of education resources on environmental information, including an increasing amount of online resources for teachers and young people, for example:

- http://www.educationscotland.gov.uk/weatherandclimatechange
- http://www.educationscotland.gov.uk/usingglowandict/glow/index.asp

- http://www.wwf.org.uk/what_we_do/working_with_schools/resources
- http://www.scran.ac.uk
- http://www.metoffice.gov.uk/education/
- http://www.gapminder.org/for-teachers/
- http://climate.nasa.gov/education/
- http://www.jointhepod.org/news-info/about/more-about-the-pod/
- http://www.bbc.co.uk/scotland/learning/secondary/geography/
- http://www.youngscot.org/info/natural-environment
- http://www.unep.org/Tunza

A number of SEWeb partners also have well established education programmes and staff with a considerable amount of specialist education skills and expertise:

- FCS Forest Education Initiative - http://www.forestry.gov.uk/website/forestry.nsf/byunique/infd-6vqgxf
- SNH Resources for Teaching – http://www.snh.gov.uk/about-scotlands-nature/resources-for-teaching/
- Marine Scotland Education Zone – http://www.scotland.gov.uk/Topics/marine/education
- KSB Environmental Education – http://www.keepscotlandbeautiful.org/what-we-do/education/
- Historic Scotland learning and resources – http://www.historic-scotland.gov.uk/index/learning/education_unit/free-education-resources.htm
- BGS Discovering Geology – http://www.bgs.ac.uk/discoveringGeology/home.html
- SEPA kids – http://www.sepakids.com

An example of an effective strategy to involve young users was demonstrated in the SEWeb Youth project, a follow on project from work SEWeb had already performed with Stirling High School, where pupils developed a number of prototype products during 4 days with target users at University of Abertay (UAD). Young users participated in the developing process of the website, game and mobile application. The key aspects were the opportunity of participating in the design, feeling responsible of the decisions made; opening the outcomes to contribution of the general public, via mobile and web; and gamifying the interaction with the environment playing a game, making it a fun experience to share with others.

SEWeb needs to make use of the existing strategies and expertise already available through the project partners to provide an engaging platform for younger users.

These strategies are largely focused on uses under 18, mainly those target users still at school and having been recently exposed to environmental education. It is also necessary to ensure that users between 18 and 35 are not excluded from the site, however this may not be such a problem as the co-design sessions conducted with adults and young people produced very similar results. The importance of targeting these is underlined by the impact that this group of users may have in the environment as they have largely already been exposed to environmental issues, are responsible for their own finances and are able to make their own life choices. This participation can elicit ways of action, such as collaboration, activism or environmental friendly behaviour across other user groups (e.g., intergenerational or trans-cultural means) by using different platforms (e.g., ICT, media) that can be promoted by and promote SEWeb.

SEWeb should engage 18-35s in the site content through the promotion of participation, sharing experiences and the use of social media.

3.1.2 Professional Background

The survey and the workshops showed that there is a range of potential users across a variety of professional backgrounds including government, public sector, education, research, voluntary sector and media. Most of the public, voluntary and government users who responded the survey and attended the workshops were probably directed to SEWeb by peers or colleagues and presumably aware of other sources of environmental information. In contrast the other user groups did not necessarily already know if SEWeb existed or what its purpose was and would aim to use the site for more general information.

Expert users will look for specific information but may want to connect this with information out with their own field. Non-expert users are more likely to be searching for general information around a topic. There is a high probability of leaving the website for both groups if the visitor does not easily and quickly find what they are looking for.

SEWeb cannot assume that all users know what they looking for and must ensure that all information is easily accessible, searchable, understandable and clearly identified by a generalist user.

3.1.3 User Profiles

Persona templates are included in the annex of this report, and recreate a story behind a representative user of each of the potential SEWeb groups. The aim of the profiles is to contextualise the use, taking into account the reasons, motivations and goals of the use of an environmental website such as SEWeb. These personas were inspired by the workshop participants and their discussions during the workshops. Five different profiles were created: Industry Regulator, High School Teacher, Environmental Photographer and Agricultural Researcher, Retired Florist, Secondary School Student. They covered some of the groups

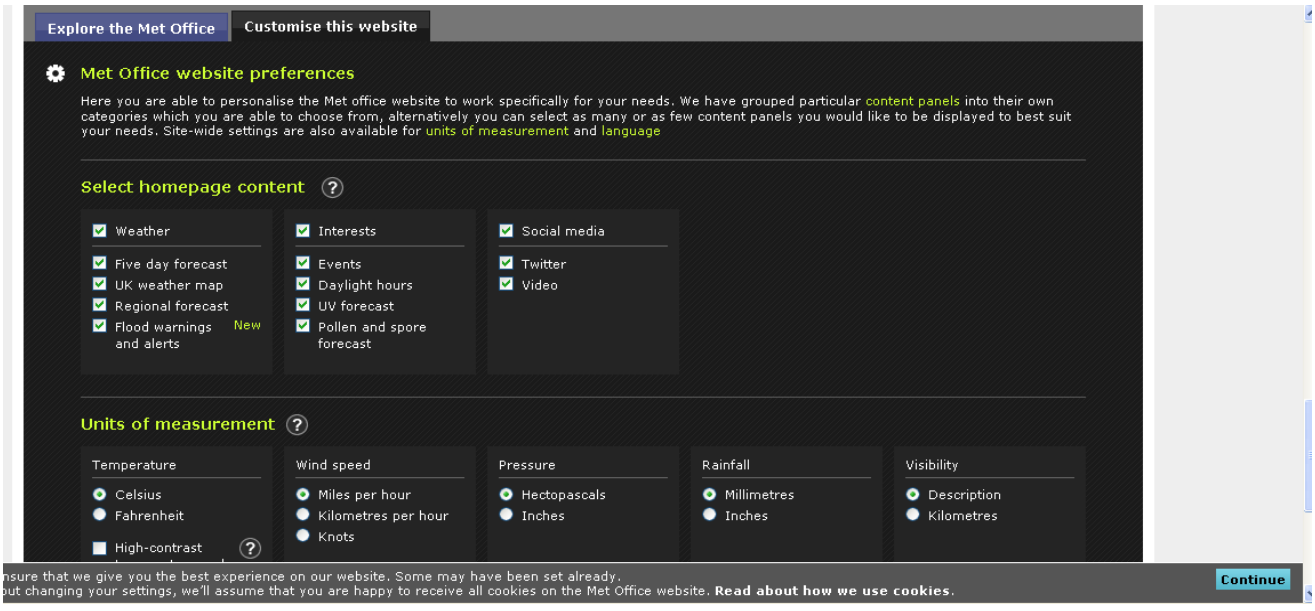
identified in the survey, such as Industry, School (Teacher), Academia, Other (Hobby), Elderly and School (student). The last two are also representative of elderly and young users respectively.

They all represent a wide spectrum that could be covered by the SEWeb Site. If any of these groups are intended to be covered in short, middle or long term the utility of the Persona template provides information to ease such inclusion, specifying a catalogue of minimum requirements. These templates can be used by web designers to analyse, select and check which of the purposes of these users are covered by SEWeb currently or in the future. It is a realistic template based on current and future users that serves as a tool for web design.

The personas highlight the range of users that may wish to use the site, but it also allows the identification of how these users wish to use the site and the commonalities between each group.

It is more important for SEWeb to focus on how the users wish to use the site rather than the focus on developing a site for a particular user group (section 3.2.6).

This could be achieved either by applying strict use categories, such as expert, non-expert and educator or a more flexible approach could be adopted where each user can save their own preferences. As mentioned previously this type of approach would require an authentication or cookie based data storage mechanism. This is similar to approached taken by the Met Office (http://www.metoffice.gov.uk) where users are able to customise their own site data and information viewing preferences.



3.2 Tools and Technologies

SEWeb has a number of aims that it can only address by utilising new tools and technologies namely;

- To use more interactive web features to present environmental data and information in a format that is relevant to a wider range of web users and environmental stakeholders
- To provide a website that embraces new creative digital technologies and creative web design to optimise the SEWeb user experience so that the success of the project will continue long after the LIFE funding concludes
- To use new digital/social media technologies, that can help to effectively communicate environmental information, increase understanding and awareness and contribute to changing behaviours

The following section provides information about tools and technologies that can be used to effectively fulfil these aims and address the user issues identified through the current site survey and the workshops performed.

3.2.1 The SEWeb Presence

In simplest terms a web site is a single entity, with a single address (URL) where a user can go to find out information in a particular area. This is the common format for many public sector organisations and local government web sites (e.g. www.dundee.gov.uk , www.pkc.gov.uk). The organisations are so well known and structured that they need little advertisement and users will go to them because they know what they will find there, this is not the case with SEWeb which is not an organisation, no local role or remit and no brand. The sites themselves are generally designed with an information centric approach in mind, were a user will be looking for something specific, click the link on the home page to the information they want and then find that information. The main disadvantage of this type of model is that if the user does not know of the site's existence, they may find the site and content within the site very difficult to find. As the sites are designed to provide specific information they often become hard to browse as the user is directed to a particular piece of data within the site.

A web-presence describes a particular organisations existence on the internet; it represents the footprint the organisation has. It is much more about providing a range of interconnected services across an array of platforms. An organisations web presence can be measured by the number of online locations an organisation is active in, including their main website, daughter sites, mobile sites, apps, social networking profiles, search engine rankings and backlinks (links directing users back to the site). A good web-presence allows a wider range of users to find and interact with the organisation much more easily through systems they already use, this is particularly effective for organisations which need to promote their presence, bran or idea nationally and even globally. Figure 3.1 shows a range of online services and how this spreads from the main site, the example here is for a small business but the same approach can easily be adapted to spreading the idea of Scotland's Environment and the data sharing objectives.

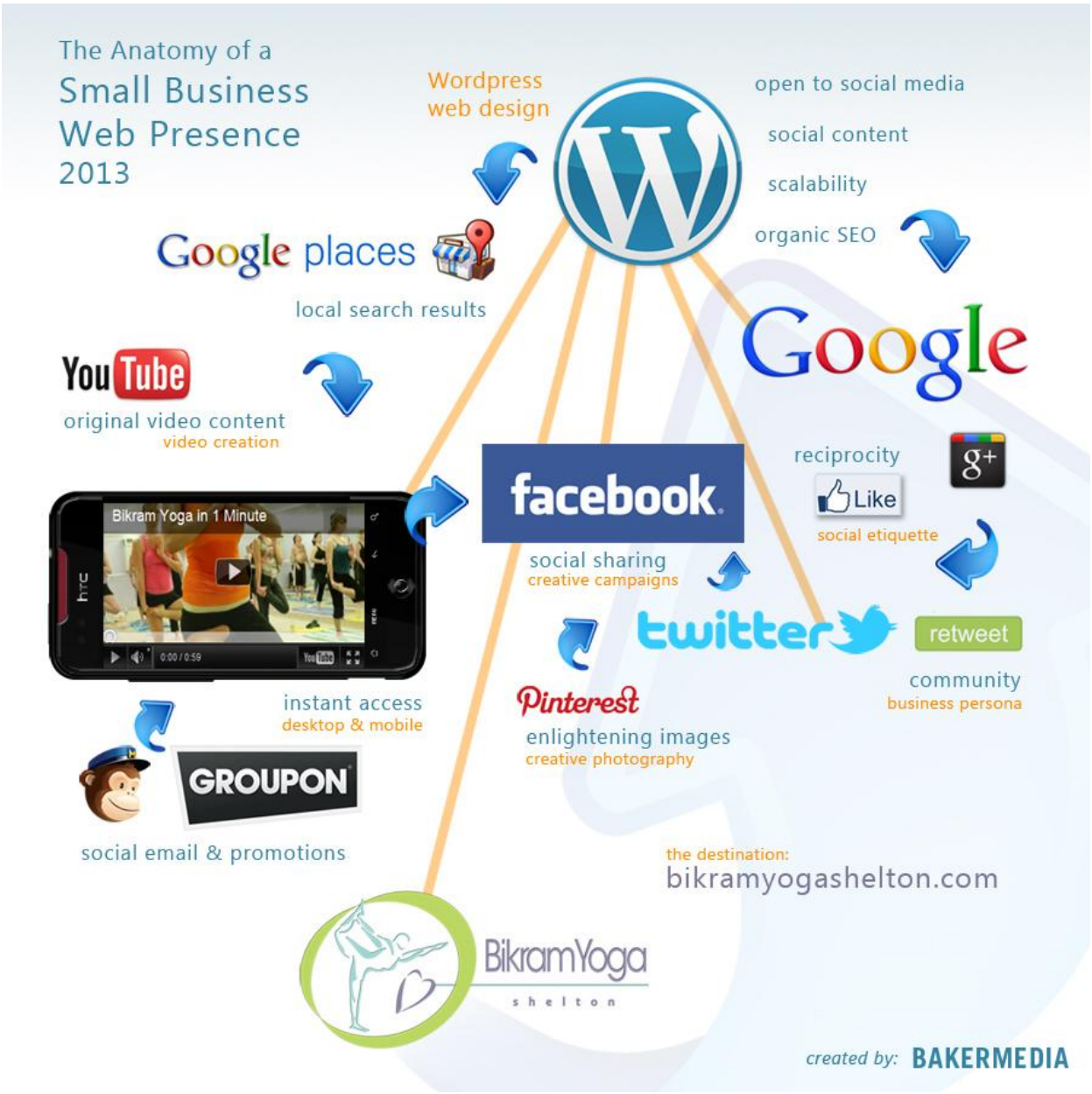


Figure 3.1: Example Web Presence

SEWeb is in a position where at the minute its web presence is small, with few links to external services and a relatively small number of backlinks. It is the aim of SEWeb to provide information about the environment in a suitable form, and promote awareness about environmental issues. Precisely because SEWeb is not an organisation but draws on information and data from partners with the aim to spread awareness and share data it is even more likely to benefit from a stronger web presence.

SEWeb can attract a much wider range of users, in greater numbers, by expanding its web-presence this will lead to more potential users being exposed to the information provided.

the idea of accessing shared information is spread. This also has clear benefits to SEWeb partners, an expanding SEWeb presence will in turn expand the interconnected presence of the partner's sites and vice versa. Partners who show data and info via SEWeb also get the benefit of an extended web presence, showcasing their information and data. How this expansion of web presence can be achieved is suggested in the following sections.

3.2.2 SEWeb as a Data Curator

SEWeb's main objective is to become the "Gateway to everything you want to know about Scotland's Environment" and the workshops highlighted that there is a lack of a single trusted source of environmental information. SEWeb has a clear and unique opportunity to provide a trusted first port of call for environmental information. As SEWeb will not host information its self it would act in a similar fashion to an art gallery curator or Shop Window, selectively providing quality, up to date , easy to understand and, where relevant, summarised information and data from trusted providers allowing the users to be confident of the data or information they were accessing. This would be an extension of the current SEWeb library but should be a much more prominent feature of the site and provide a much wider range of information acting as a curator for all published/open environmental data in Scotland.

> By positioning it's self as a trusted information and data "Gateway" SEWeb can extend its web-presence by facilitating easier access to environmental information that can be distributed on social networks and by allowing environmental data to be consumed by web and mobile applications.

This approach has already been taken by number of organisations in the UK, including the Met Office (http://www.metoffice.gov.uk/datapoint), the Police (http://policeapi2.rkh.co.uk), the Food Standards Agency (http://ratings.food.gov.uk/open-data/en-GB) and the UK Government (http://data.gov.uk/api). These organizations provide a Web based application programming interface (Web API) which allows software developers access to the data to use in their own applications. The API allows the developer to contact the database via the internet and retrieve the data they are interested in.

This process opens up the data to use by any developer, and will greatly expand SEWeb's presence by allowing users with very little initial interaction with the main site to still have access and be influenced by the environmental data presented. This model of opening up data for use by mobile developers is being taken by a number or organisations, including Natural England and The Environment Agency in the "My Environment App Competition" http://www.naturalengland.org.uk/advice/myenvironment/mobileapp.aspxl; the Environment Agency at their recent "Env:Hack day that brought together around 80 software and hardware developers, Environment Agency experts and environmental data to create demo's that could showcase how technology can help encourage people to be more green and environmentally responsible; and the US Environment Protection Agency PA with the creation of dedicated web space targeted directly at developers looking to access environmental data using feature web services http://www.epa.gov/developer/

There are however some concerns in opening up the data in this way, mainly that the data could either be misused or could have some commercial benefit to either SEWeb or the providing organisation, which is then lost due to the opening of the data to external developers. The data provided by SEWeb could be used by an external developer in a commercial application and not just to provide information. Allowing open access to use the data in this way could remove a possible revenue stream for SEWeb and the partner organisations.

To allow for this APIs are usually open using a key system. Each developer who wishes to use the data needs to register for a key, their application then uses this key to access the data. If SEWeb wished to revoke access to a particular developer they can simply ban the key and the data access is removed. Access to data can also be limited, SEWeb can allow each key to connect only a limited number of times within a given time period, this means any specific app or site cannot use an extreme amount of data. Many companies use the key system to charge for data access, limiting the number of requests allowed for free users and not for paid or commercial users. This approach would allow SEWeb and partner organisations to collect some revenue, even if only for data maintenance, from commercial developers – a consideration for the longer term sustainability of the project beyond the provision of the European LIFE funding. Google uses this approach for most of its data and search APIs. Alternatively free data, defined by the partner organisations, could be brokered by SEWeb and requests for commercial use redirected back to the partners. This is an important consideration for SEWeb, as it moves to more interactive Web Feature Services that will allow data download facilities.

Using an API Key system such as this, SEWeb could track, monitor and report on how data is being used and by whom, provides a measureable benefit to data providers to SEWeb. Academic and University data providers would be able to quickly determine the impact, scope and reach of their data, to aid in reporting and future funding applications under the Scottish Funding Council's Research for Excellence Framework.

3.2.3 SEWeb and Social Networking

Social media is an extremely powerful tool for increasing web presence and engagement with potential users. Currently just fewer than 60% of people, over the age of 16, in the UK are members of and regularly use some form of online social network. This rises to 94% for those aged between 16 and 24. (ONS 2011). Clearly social networking has become pervasive, especially in the younger generation.

Many organisations have already taken advantage of the rise in use of social networks and social media to increase their web-presence. They are most commonly used by media organizations, for example the BBC has blogs, Facebook pages for different shows, twitter feeds and photostreams. This means that even if the users of these services never visit the main bbc.co.uk site they still have an interaction with the information provided by it. Similarly National Geographic magazine, utilises a number of social media streams to help promote both the magazine and the work of the National Geographic Society. Subsequently the societies' Instagram, a photo sharing site, feed has become one of the most popular with over a million followers.

Many existing sites have tried to use the popularity of social networking sites to increase their web presence by adding sharing links to their pages. However this largely misses the point of social media. How many times will someone share the same home page or the same information page? It is likely one visitor will share the page once; their "friends" then may visit the site and also share it. At this point there is likely to be a large overlap in those "friends" who have already seen the site and will not visit again, so the initial impact dwindles extremely quickly. As the same page is being shared continually, the post is likely to be repeated, quickly becoming viewed as and annoyance or "spam" posting.

To use social networks effectively SEWeb must allow a community to develop naturally around the site by providing useful information across a range of social networking sites. Much of this information dissemination can be automated. A single news item can be reproduced across any number of services with links back to the originating site for more information. Not only does this increase traffic to the originating site, it will also affect the sites position in a search result as the popularity of a page is largely based on the number of links which refer to it (its backlinks).

Many organisations and companies have already adopted this approach to distributing information via a number of channels; the Scottish Government for example, will post similar information on its Facebook page as it does on its Twitter account. On the Scottish Government site users are asked to "like" the Scottish Government or "follow" them on Twitter, and not to share a single page. That user will now receive updates posted on the Facebook page or twitter feed. The user may choose to like specific posts, these will be shared to their friends, if their friends are already following updates they will receive the post anyway so are not being "spammed". If the user is not a follower they will only see the post once and can choose to read the post or ignore it. The point here is that the post will link back to the original article on the Scottish Government site. Other SEWeb partners (BGS and Keep Scotland Beautiful) are already using this approach.

A number of SEWeb partners have a clear presence on social networks;

- BGS
  Facebook - http://www.facebook.com/BritishGeologicalSurvey
  Twitter - https://twitter.com/BritGeoSurvey
  YouTube - http://www.youtube.com/user/bgschannel?hl=en-GB&gl=GB

- Keep Scotland Beautiful
  http://www.facebook.com/KSBScotland?fref=ts

- SNH
  Facebook-http://www.facebook.com/pages/Scottish-Natural-Heritage/
  Twitter - https://twitter.com/SNH_Tweets

SEWeb can, and should, simply repost the updates on these partner streams as latest news items or "trending updates" on the SEWeb home page. RSS news feeds from partner sites can also be included, again linking to the idea of a single trusted source. However these approaches still requires the users to actually know of the sites existence and to visit the site.

SEWeb ultimately needs to follow the example of the partner sites and create its own presence on social networks rather than rely on using the established networks of SEWeb partners.

Once the profiles on the sites have been created the transmission of information can be largely automated and updates to the site simply "pushed" to the various social networks via the content management system the site is already built upon. Social networks also provide an important opportunity for users to comment and feedback on the information and issues being shared. The more sites SEWeb creates a profile on, or interacts with, the greater potential for catching new users there is. However SEWeb should initially concentrate on the most used networks to gain the greatest impact.

Table 2 : Social Network use in the UK (2011, UMPF.co.uk)

Network	UK Users (Million)
Facebook	37.4
Youtube	32.1
Twitter	15.5
LinkedIn	7.9
Flickr	6.7

As shown in Table 2 Facebook and YouTube are currently the most used social networks in the UK. YouTube being a video based site requires more work to produce the video based content and this cannot easily be automated. Initially SEWeb should concentrate on creating a working Facebook profile, once this is established pushing the information further out to other networks will be much easier.

As SEWeb represents the Scottish Environment, it is has a unique opportunity to exploit this on social networking and social media. In particular photographs of Scotland's environment could easily be used across a number of networks, especially Facebook and Instagram to garner greater interaction and knowledge about the site. SEWeb already posts news information on to its website; this could easily be transmitted to Facebook and Twitter to create a naturally evolving social media presence.

3.2.4 A Mobile SEWeb

Technologies, such as smartphones and tablets, represent the most recent step in the evolution of portable information and communication technology. Essentially hand held computers, they not only offer the user portable access to standard internet based services such as banking and shopping, but through mobile applications (or Apps) can be used to perform a vast array of communication, entertainment and assistive functions. Take up of smart phones in the UK has

risen from 27% in Q1 2011 to 39% in Q1 2012 and this level of uptake is predicted to continue. This dramatic rise in use will not only increase the ubiquity of mobile devices but it will also change how society in general accesses services. Already 40% of the UK adults now view their phone as the most important device for accessing the internet and as Figure 3.2 shows it is predicted that around 2014 the number of mobile internet users will overtake the number of users accessing the internet from desktop machines.

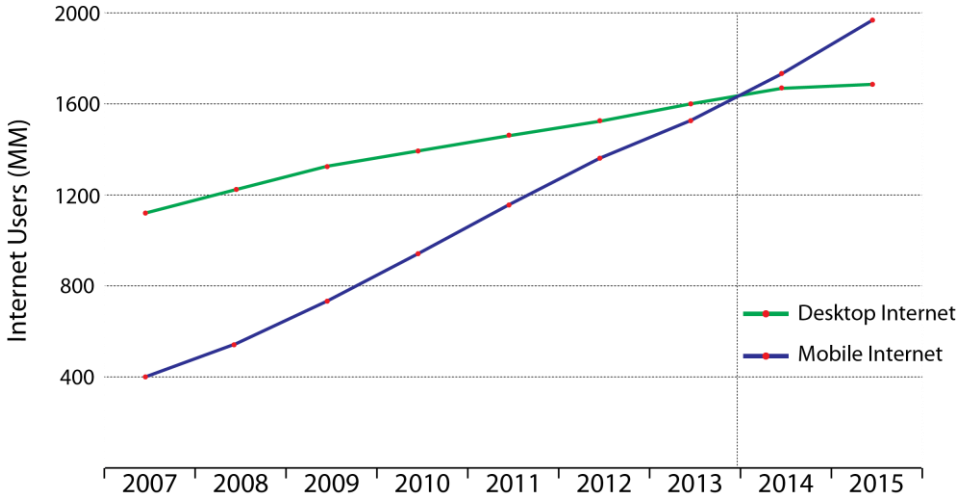


Figure 3.2 : Graph showing current & projected Mobile Internet use vs. Desktop (fixed) internet use [Morgan Stanley Research]

It is clear that mobile technologies are fundamentally changing the way we interact with the world. The site survey responses show a high percentage of responses from people wishing to enjoy the environment often these users will wish to access the information they are looking for whilst they are out in the environment.

If SEWeb wishes to engage a wider range of users it will need provide the same level of user experience on mobile devices as it does on desktop machines, but not necessarily the same level of information.

Mobile access does not entail the development of Apps but simply the development of a mobile friendly version of the website. When a website which has been created with no mobile alternative, such as the current SEWeb site, is viewed on a mobile device the site will appear just as it does on a desktop machine. However because the screen on a mobile device is much smaller the components of the website will become much harder if not impossible to read. The user may be able to zoom into the site, but this will require the user to zoom as they are reading as a full line of text on the desktop version will be larger than the mobile screen size. This issue was specifically raised during the workshops where much of the information available on the websites was in leaflet or document form (largely pdf format). Info in these formats can be easily downloaded on a desktop computer but are much too large to download and to read on a mobile device.

The workshops and surveys highlighted that SEWeb needs to have more dynamic/up to date, regularly refreshed information; this could be a focus for the mobile based site. The current SEWeb website content is largely static, once a visitor has read it, there's no real reason for them

to come back as there are no obvious refresh or updates. As users are more likely to be looking for short, up to date, local information on their mobile than looking for in depth reports, the mobile site could provide access to more dynamic content in the form of rss feeds from partners, trending social media environmental topics, seweb partner twitter/facebook posts in once place.

It is now quite common for sites to provide mobile alternatives which are designed to be viewed on mobile screens. These are driven by the same base data but present the information in a way more suitable for mobile devices. Information is usually presented using simple headline links which can then be expanded to provide the desired information when selected by the user. JQueryMobile (http://jquerymobile.com/) is a technology that has been designed to make it extremely easy to convert dynamic internet sites into mobile friendly sites. It has a wide array of user interface components which are specifically designed for mobile screens, but are implemented in the same way as their desktop browser counterparts. Using a technology such as JQuery coupled with the data curator model described in section 3.2.2 should mean that there is little extra development for the creation of the mobile site as the supporting information will be the same; it will simply be the presentation of the data that will have changed. There are varied examples where this link between mobile and main site has been successfully achieved. One example of how to transform the content and the layout of the website depending of the device used can be seen in the US Environmental Protection Agency (Figure 3.3 & Figure 3.4).

Figure 3.3 : US Environmental Protection Agency PC version

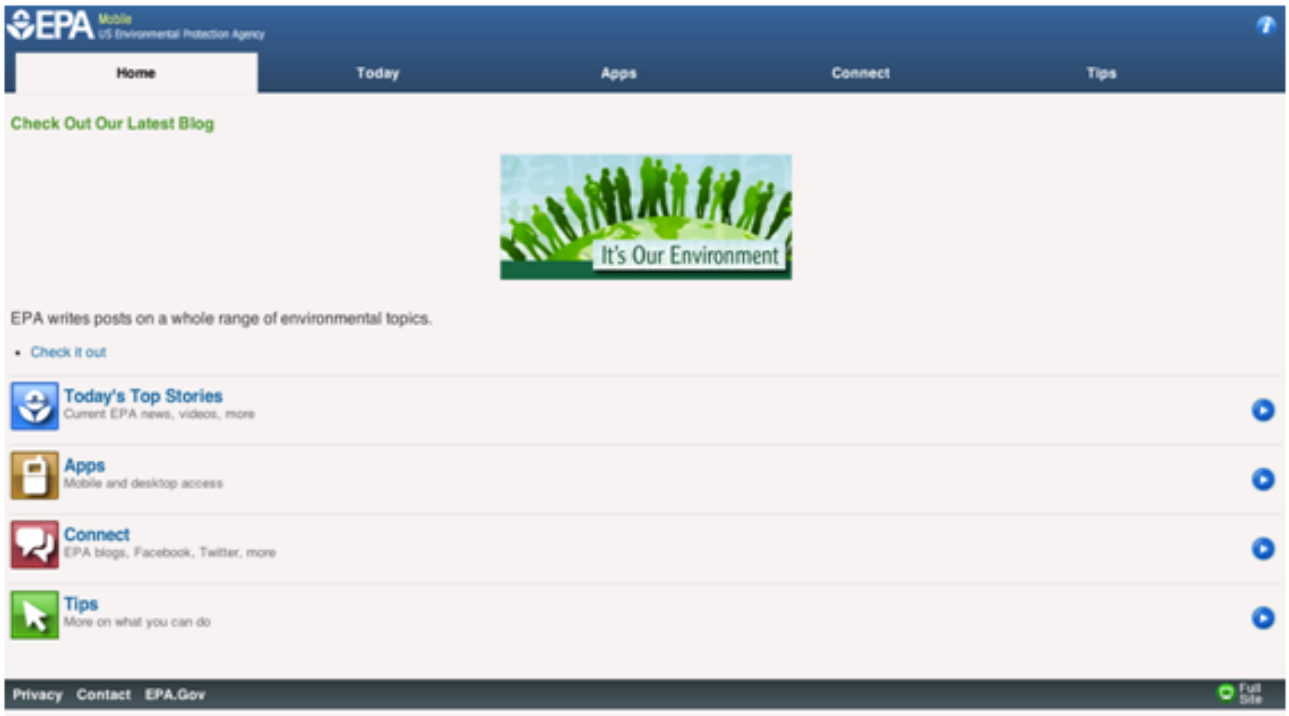


Figure 3.4 : US Environmental Protection Agency Mobile version

This process is also evident on the BGS website where both the mobile site and the main website display the same data in different forms (**Error! Reference source not found.** & **Error! Reference source not found.**)

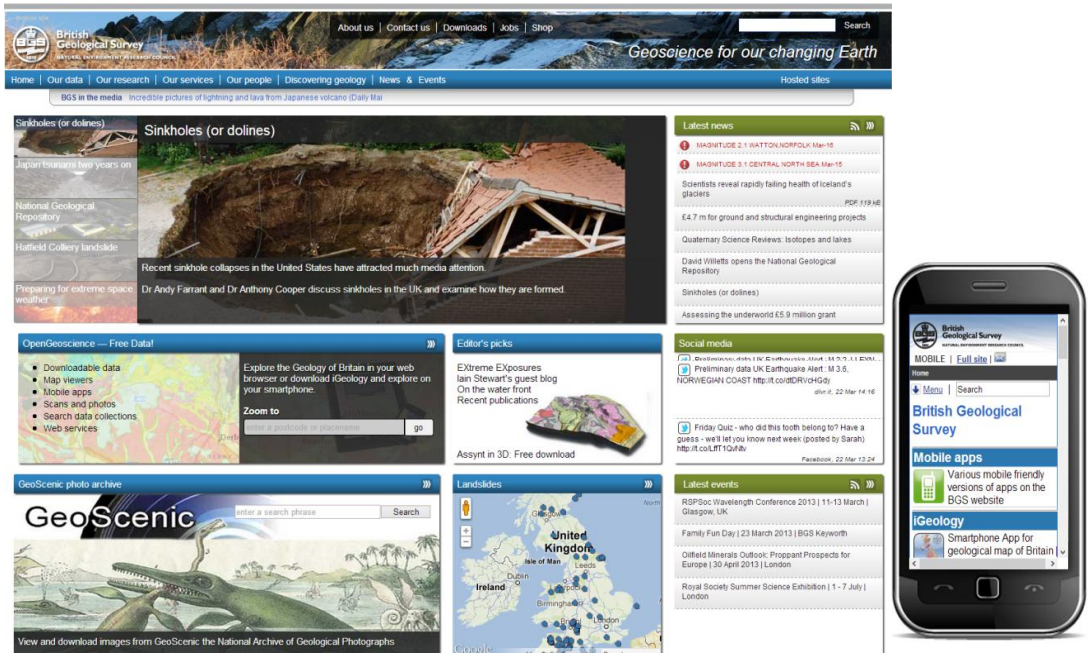


Figure 3.5 : The BGS PC and Mobile site versions

It can be appreciated the difference in the content shown and also in the structure of the information presented. In the case of access with PC, the size of the screen (an average of 17/19 inches) and the different type of interaction (mouse, keyboard or track pad) allows to display much more information content, sections and images. (e.g., Info by state, News & Announcements) In the mobile version, the amount of visual and written content is reduced to offer components based on their functionality (i.e., Today's Top Stories, Apps, Connect and Tips) due to the reduction in size screen (average of 4-5 inches), context of use (e.g., public space) and time availability (e.g., in the course of a main task like a trip, conference or waiting room). Using responsive mobile device technology would meet one of SEWeb's aspirations of providing information and data "in a "suitable form for all users" (SEWeb website vision – 2011)

As well as simply allowing access to the current information in a mobile version, mobile devices allow the use of a much wider range of functionality that can increase engagement with the SEWeb. Most modern smart phones will contain GPS receivers which will allow the site to identify where the user is and to tailor the information presented to that location/area. Mobile devices also provide an important facility for the users to upload information, photos, comments and other user generated information collected whilst "on the go". This links strongly with the recommendation that the site should make use of social networking for user engagement and feedback. There are also strong links to the education sector where there is a desire to use mobile devices to support outdoor education through the data capture and upload.

The unique functionality provided by mobile applications can be further utilised to extend the engagement of the public in the SEWeb Citizen Science and Citizen Action initiatives. Mobile applications could be developed to help citizens record and upload environmental data and to inform users of and enable them to take part in specific actions. These apps can be used to source views and comments from wide sector of society to help identify key environmental issues, identify data gaps and incorporate new data and citizen science observations; essentially "crowd sourcing" environmental data. These applications will then act as examples to encourage developers to create their own applications using the data provided by the data API described previously (page 41).

SEWeb must utilise the unique functionality provided by mobile devices to encourage interaction with the site, both in terms of data access and user sourced information and feedback.

Public sector websites commonly reproduce the material they would traditionally provide as leaflets and other printed matter in web form. It is clear from the site survey and the workshops that the current users and as suggested here the potential future users demand more than this. The traditional layout of information and data largely precludes navigation and data access for those unfamiliar with the environmental data they are looking for. The workshop showed that expert users, even those that thought they knew where it was, had trouble finding information outside their specific area of expertise.

SEWeb already aims to move away from published environmental records to use more interactive web features to ensure better engagement with the information. SEWeb has invested heavily in interactive data visualisation software, Spotfire, which should, once fully implemented allow the user much greater opportunity to find and create new connections and correlations between the data sets provided by SEWeb partner organisations. The ability to visualise data in new ways, to use spatial data more imaginatively and being able to overlay data from different sources, in one place is huge added benefit of SEWeb, and big draw for returning customers as it is unlikely they can do this anywhere else. This also feeds directly into the findings of the Scottish review of Strategic Environmental Assessment (2012) where it was found that there were difficulties in bringing datasets of different spatial scales and sources together, it was too time consuming to locate and interpret some data and that it was difficult to access data about trends over time. The provision of new data presentation and visualisation functionality will allow SEWeb to provide valuable services to both expert and non-expert users.

As has already been discussed one of the major concerns which arose from both the workshop and the site survey was the mapping system currently available on the site. Most of the problems with the map did not stem from a lack of data but that it was sluggish and difficult to control. It was also highlighted that the maps did not function at all on Apple devices and seemed to be extremely slow, if functional at all, on any mobile device. One of the advantages of a map based data display is that it could be configured to automatically display information about the user's current location it was suggested that this would be even more beneficial on a mobile device where the location is already known, via GPS or similar technology, allowing the map to display local environmental information to the user.

SEWeb should incorporate technology in the WIMBY tool that can identify the users location via GPS on a mobile device and via their IP address on a desktop machine, this location can then be used to automatically provide local information.

A key issue with SEWeb maps seems to be the current mapping technology used by the site is unsuitable for the type of usage scenarios that SEWeb is being designed for and uses a control system the majority of users are unfamiliar with. The rise of online map based information systems such as Bing Maps, Google Maps and Google Earth, all of which have similar control systems and provide a speed of service and interaction that general users have become accustomed too. If SEWeb does not provide a system with a similar level of responsiveness it is likely that the system will leave the user with a poor experience and ultimately become redundant. Marine Scotland's National Marine Plan Interactive, (http://marinescotland.atkinsgeospatial.com/nmpi/) (Figure 3.6) already uses an alternative system based on openstreetmap (www.openstreetmap.org) which provides similar controls to Google Maps and a comparable level of responsiveness whilst still providing a large array of data layers. From the Co-Design ideas presented at the workshops, and feedback from the Website Survey, the National Marine Plan Interactive map tool is a good example of presentation and functionality that SEWeb should look to learn from.

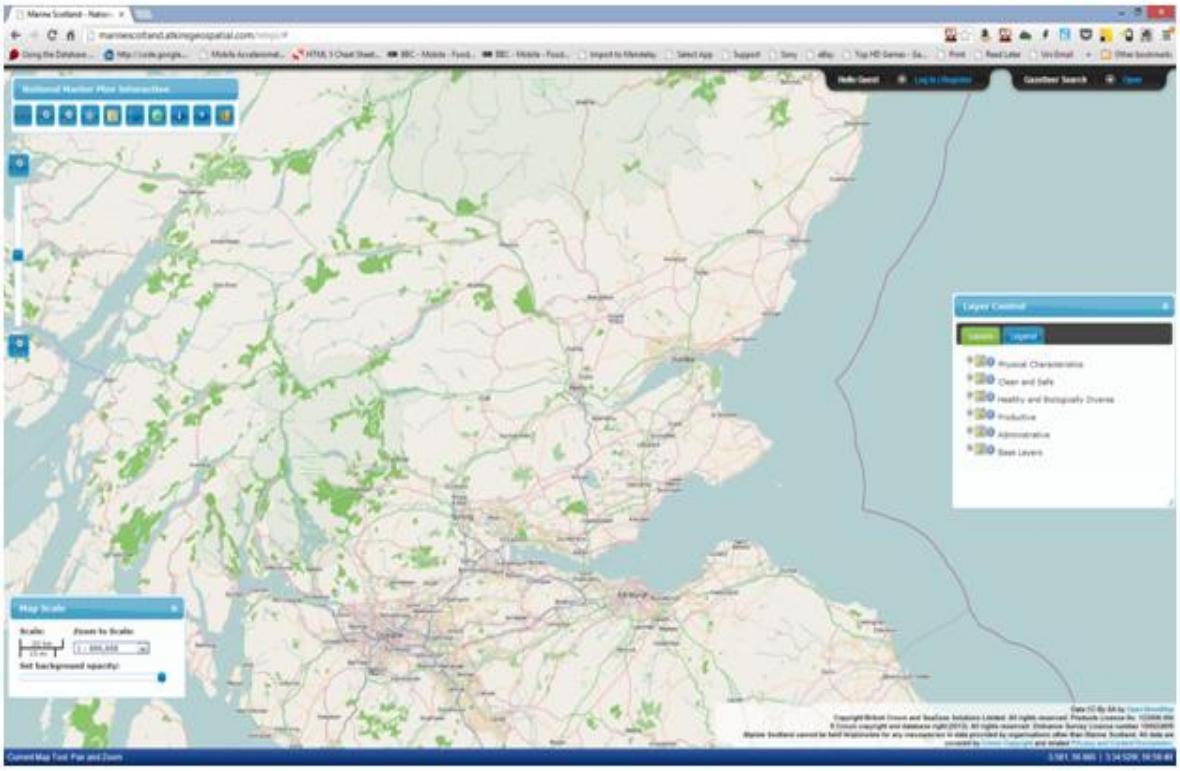


Figure 3.6 : Marine Scotland's National Marine Plan Interactive, based on the openstreetmap (www.openstreetmap.org) mapping framework

Ultimately SEWeb should look at either utilizing a commercial mapping system such as Google Maps or an open source system such as openstreetmap (www.openstreetmap.org)s or mapnik (www.mapnik.org), to provide map based data mining.

Technologies such as WebGL also provide advanced data visualisation functionality. Based on computer game render technologies web gl provides a web based 3d environment. This 3d environment can be coupled with geographic data to create interesting and engaging data visualisations that can help to explain complex scientific data to a much wider audience.Figure 3.7shows an example of WebGL technology visualising global population data.

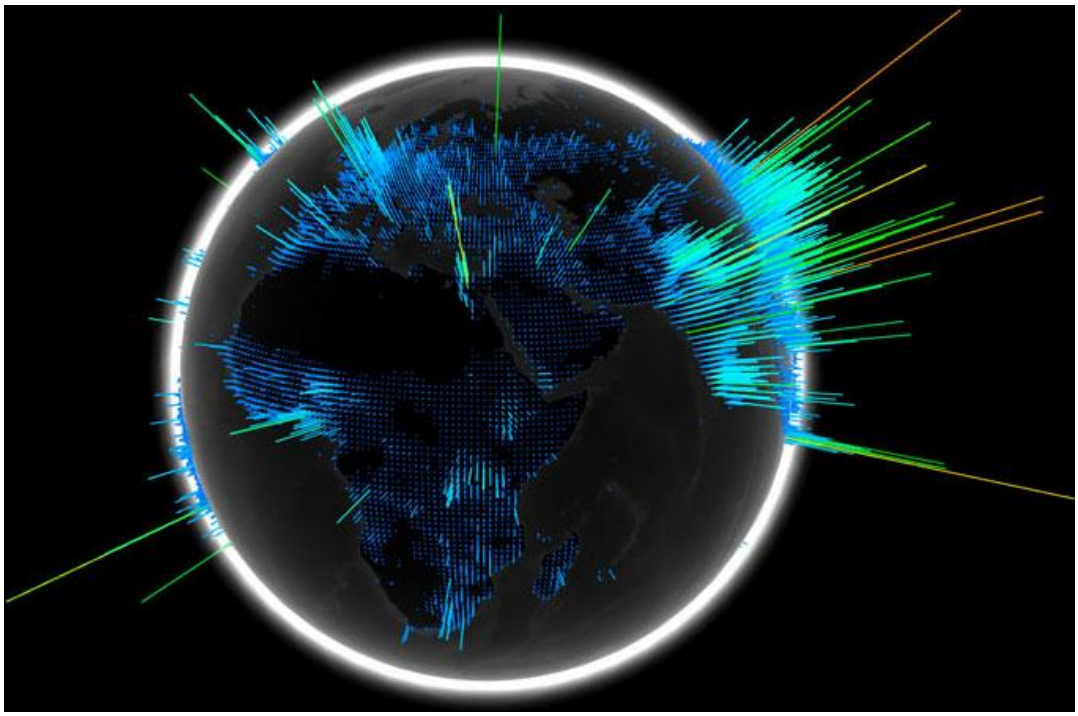


Figure 3.7 :WebGl Globe example showing world population

The climate division at NASA (http://climate.nasa.gov/interactive) has taken a similar approach to making its scientific data much more engaging, and interactive through visual representations. Figure 3.8 shows the climate time machine where users can interact with a time slider and see the effect on the US coast line. This is simply a collection of GIS over lays but the way in which it is presented allows greater engagement with the user through simple animation and interaction.

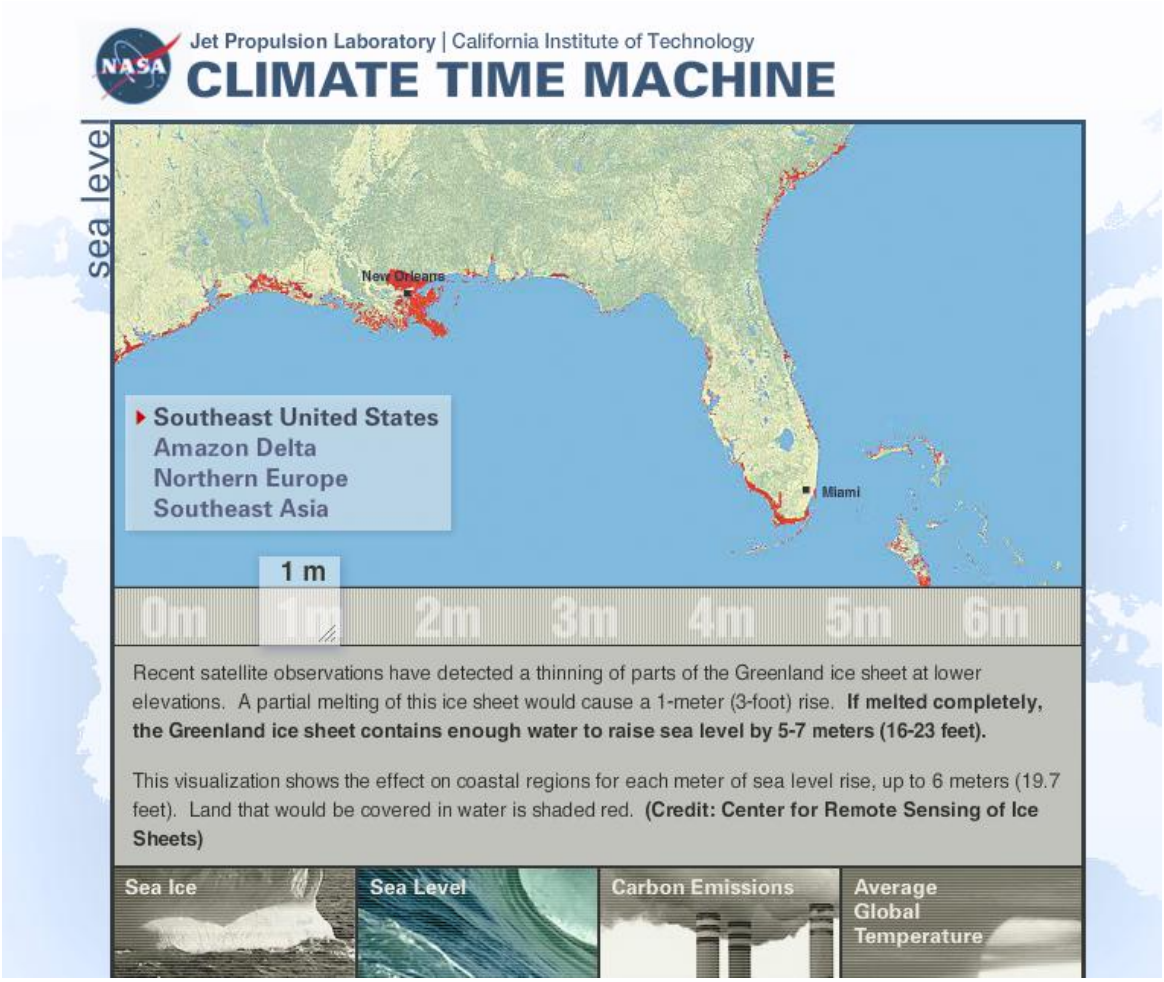


Figure 3.8 : NASA Climate Time Machine

Info Graphics

As well as providing interactive graphics for data mining and visualisation, SEWeb could also provide info-graphics as a way of simplifying the information being presented. Info graphics attempt to provide information is ways which are natural and easy to understand.

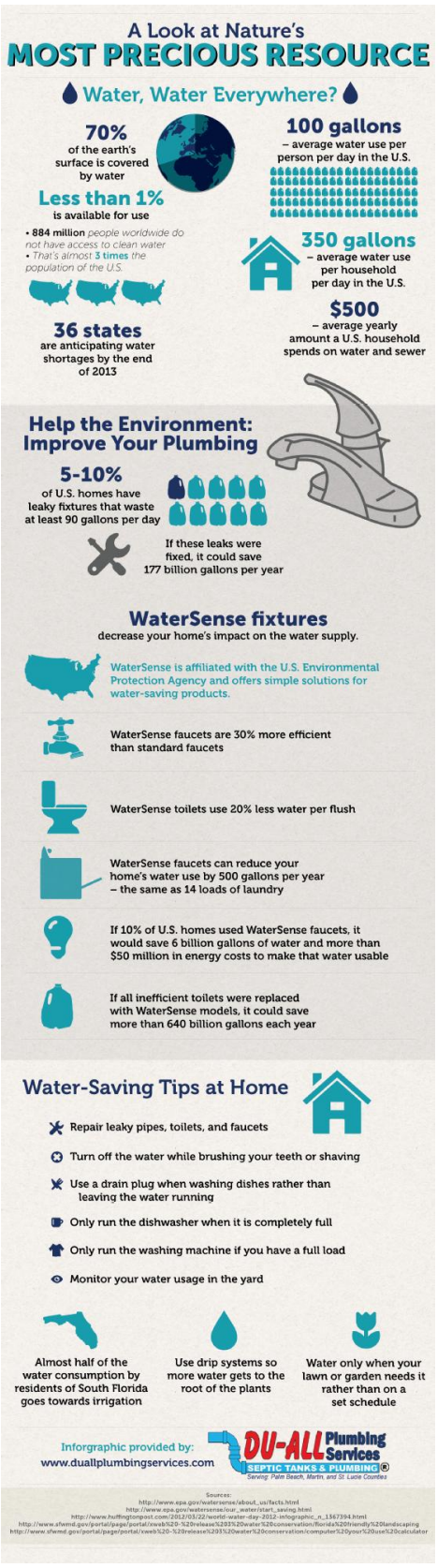


Figure 3.9 : Example of Info-Graphics

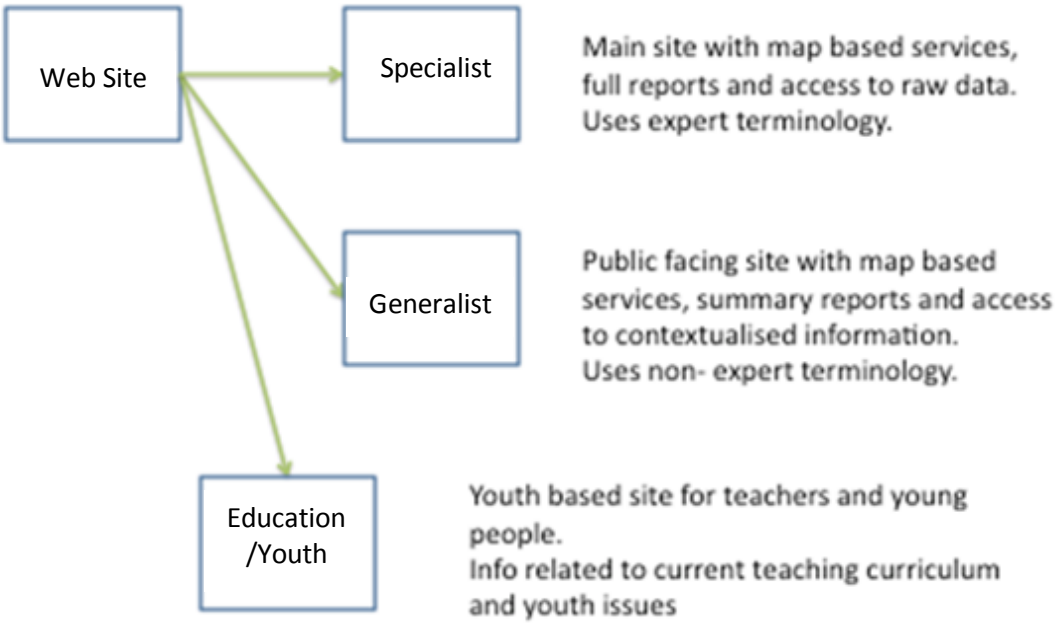
They are usually created by artists in media design and they deliberately resemble the look and feel of adverts. Essentially info graphics are designed to advertise the information they are presenting. To create info graphics of a high enough standard SEWeb would need to ensure they have this art and advertising design skill set.

3.2.6 A Use Orientated SEWeb

The workshops and the survey results show that there is a wide range of users who would like to access the information provided by SEWeb. The danger here is that by attempting to cater for a very wide range of user types, the site may not be suitable for any of them. Some users expressed a desire that the site is customisable, providing the ability to save their most used searches or data and what information would appear on the home screen. This user orientated approach would overcome the problem of users not being able to find the data they need. However it is appreciated that the overhead of maintaining secure user profiles for a vast number of users may be prohibit this approach and SEWeb should make a decision whether the ability to learn more about SEWeb users and how the information is being used outweighs this overhead.

From observing the participants at the workshops and studying the comments made it is believed that a compromise approach can be reached by designing the site in a use orientated way rather than user orientated. SEWeb can use this approach to provide use specific content depending on what the content will be used for. Specialists, who understand scientific terminology, are likely to be looking for a particular piece of data or a collection of data set that they can compare either on a mapping system or not. Generalists, those who may or may not understand scientific terminology, are more likely to be looking for general information about the environment or information about services such as citizen science, local facilities or volunteering opportunities. Younger users and education providers will mainly be looking for information relating to aspects that they are teaching or being taught at school.

SEWeb should provide access to the information in ways that support these Specialist, Generalist and Youth/Education users.



The main point here is that that the data for each section will remain the same, however the way the data is presented will change to fit the type of use. The generalist pages will not contain the same level of detail or terminology. The youth/education pages should be much more appealing to younger visitors and encourage their use and protection of the environment but should still provide access to the scientific information relating to the teaching curriculum. The Specialist pages will provide information in a more traditional scientific form or will simply redirect the user to the host organisation for that information.

Examples of this are :

Nasa Global Climate Change web site

- for kids : http://climatekids.nasa.gov/
- for educators : http://climate.nasa.gov/education
- for meterologists : http://climate.nasa.gov/meteorologists

BrainFacts.org

- information for eductors - http://www.brainfacts.org/educators/
- Information for press - http://www.brainfacts.org/press/
- Information for policy makers - http://www.brainfacts.org/policymakers/

Developing the different pages will require more work in summarising and tailoring the information to the different use types, some of this process could be automated using natural

language processing and automated summarising, however these automated systems may not return suitable results and it might simply be better to use non scientists to develop the pages based on the specialist information and ensure the site offers a novel purpose. Adopting this strategy will overcome the terminology problems the workshops identified by presenting the information in an understandable way to the user. One of the main problems identified was that many of the environmental information sites used expert terminology and these were not identified in by the general search engine. However once SEWeb provides these generalist and youth/education versions of the pages the search engines will automatically redirect the user to the correct page. For example a user searching for “rubbish” is more likely to arrive at the generalist or youth version, where as a user searching for “waste” will find the specialist page. This process can be further enhanced by offering searches which are able to determine word families, where multiple words mean the same thing, as a query will return a greater number of results to the user. SEWeb could implement this type of search functionality themselves by using web analytics to determine where users searching for specific terms eventually arrived or use the framework provided by an external search engine developer such as Google Site Search.

4 Delivering a successful SEWeb website

4.1 SEWeb web site vision

This section describes how the tools and technologies illustrated in the previous section can be utilised based on the suggestions provided by workshop participants in co-design sessions.

4.1.1 Web Site and Associated Web Presence Models

The website model shown in Figure 4.1 attempts to address the user issues raised in the survey and the workshops surrounding the functionality of the desktop site. The site is designed in a magazine format with a high reliance on images to attract visitor's attention. The terminology used in the suggested site links have been chosen to allow generalist visitors to quickly identify what part of the site they wish to visit. The site is centred around a large image box which can be used display a revolving gallery of images, possibly user submitted, of Scotland's environment. To the right of the gallery there is a list of latest general news items, sourced from partner websites and social feeds. The links directly below the image gallery allow the user to filter news items and images on specific topics they are interested in. The aspect ratio of this top section will allow the whole section to be viewed on a standard monitor (and tablet device) without scrolling; as such this will be the most viewed section of the site.

Directly below this section are links to the most important and beneficial sub pages of the site. Clear images show what each page, the map, what's in my back yard and Get Involved/Citizen Science. Directly below these links on the left hand side are smaller image links to new site pages, updates and the most popular pages. These links again use images to entice the user and can be used to quickly find the information they need. To the right hand side of these links there is a section dedicated to events which are happening in or about the environment. This section gives partners the opportunity to publicise events they may be running and want to get the public involved with. Finally the page links to the site's social networking presence.

It should be noted that a lot of the information on the home page may be repeated, albeit in more detail, further in the site. This is intentional as it will help the user navigate to the level of information they require and will help search engines index the site more thoroughly as there will be more active links to where the information is located.

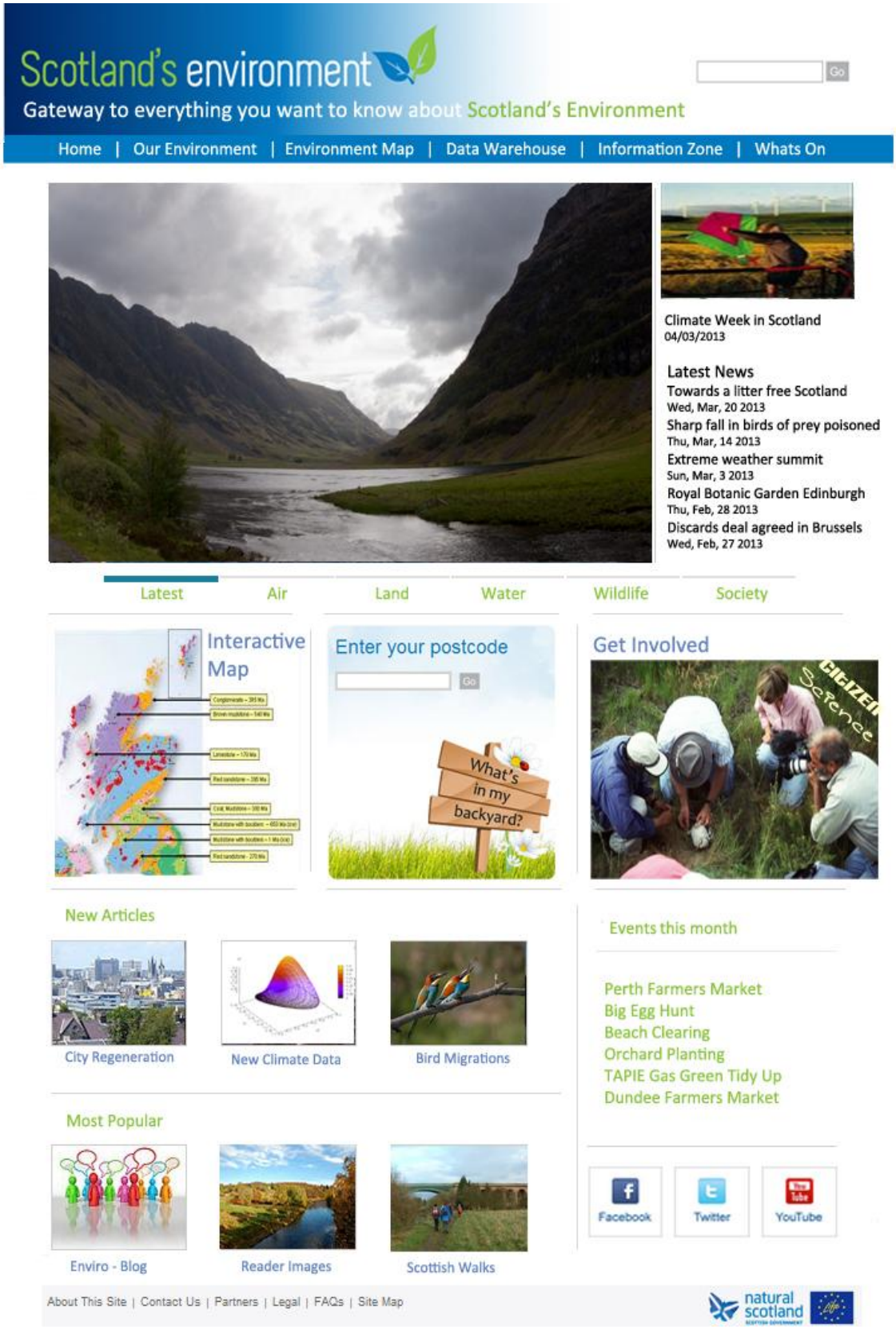


Figure 4.1: SEWeb Desktop Model

This report has highlighted the need for SEWeb to create a mobile accessible version of the website. The mobile site shown in Figure 4.2 is designed to allow users to access the latest, most important news items on the main site, local news and information, access to a mobile version of the mapping tool and quick access to events and citizen science initiatives which will allow and encourage them get involved in the environment. Figure 4.2 (left to right) shows a suggested mapping page, a home/latest news page and the site section navigation. The mapping page highlights how the GPS functionality on the mobile can be used to provide local information combined with information layers provided by the same data as will feed the main site mapping system.

The home/news page allows the user quick access to the important news items or summary information of events, which are already displayed on the main site, from the partner organisations. The suggested sections within the mobile site reflect those provided by the main site with a more mobile flavour.

The “Whats on in your area” section will use the phone GPS to determine where the user is and return events which are happening in that area soon, this section should also allow users to search particular areas they may be visiting. This is a common approach on many weather sites where the weather will initially be displayed for the detected location, but will allow the user to search for forecasts in other areas.

The “Get Involved” link will direct the users to information about protecting their environment, citizen science events or apps which will allow them to collect their own data using the phones systems. It is suggested that the info zone should link to summarised info, like a glossary, of the important facts in the main sites info zone. It is unlikely someone will be using the phone for in-depth research, but they may want a quick simple explanation of a topic they can research later.

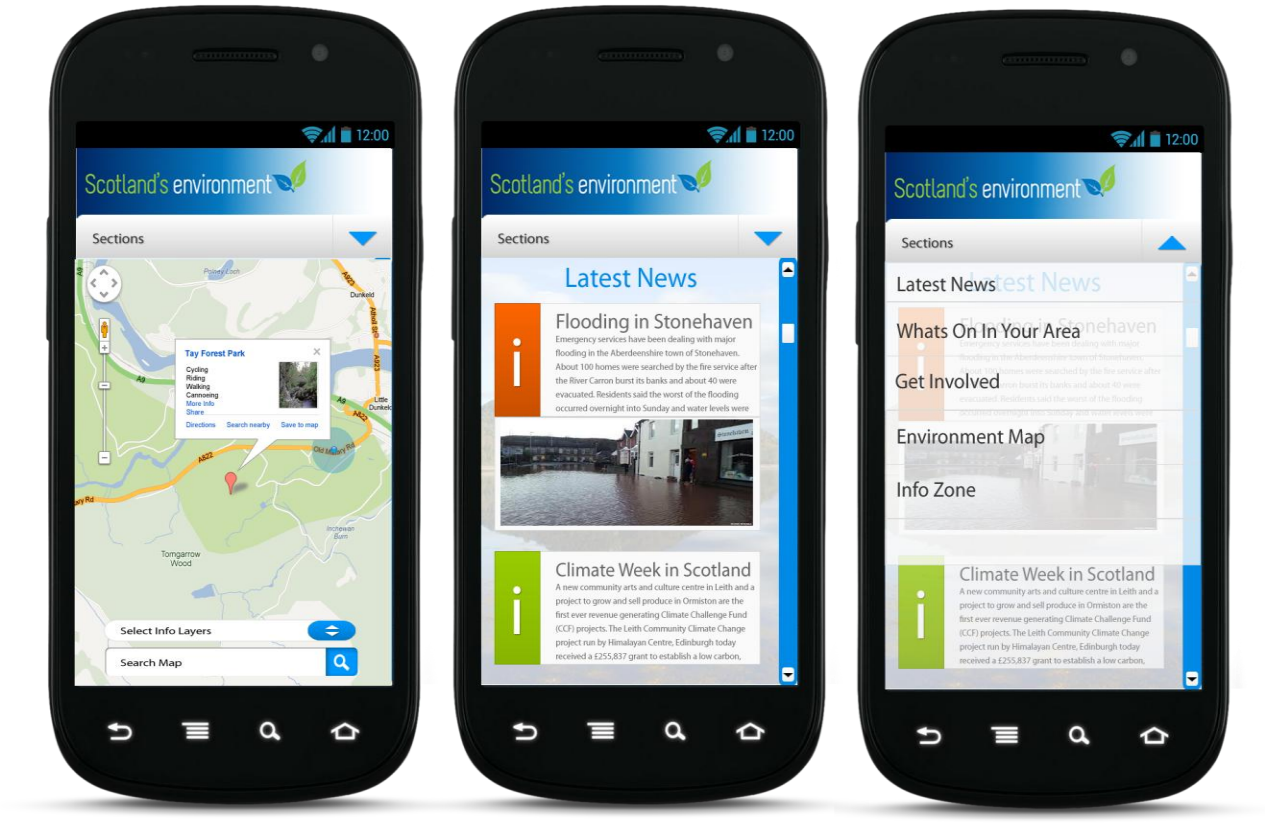


Figure 4.2 : SEWeb Mobile Model

4.1.2 Updated SEWeb web site Vision

This section outlines a recommended Vision for Scotland's Environment web site, using the findings of the research carried out for this report to refresh the March 2011 SEWeb web site vision.

Objective

Scotland's Environment Web (SEWeb) will establish a European exemplar website that brings together information on Scotland's environment so that it is easily available and understood by all users. It will be the first place that anyone would choose to look for reliable, trusted, current and accurate information on Scotland's environment from known and trusted sources.

Access to information: a trusted gateway

- The SEWeb web site will provide a single view of Scotland's Environment based on a wide range of data and information published by Scotland's environmental experts. Users will have confidence and trust in the quality and source of data or information they access through the web site.

- The web site will act as curator to Open Environmental Data published in Scotland. It will provide a web based platform to search, view and access reliable, up to date, easy to understand and, where relevant, summarised information and data from trusted providers.
- Data and research that underpins the assessment and understanding of Scotland's Environment will be made more transparent and accessible via the web site, presenting environmental quality trends and indicators in a variety of viewing formats that are suitable for different data interests and uses.

The site will initially focus on access to information that is suitable for a more Generalist Audience.

- Straight-forward descriptions including summaries, key messages, podcasts and images of Scotland's environment, will be presented in a relevant format and accessible by devices that are suitable for the interested general public.
- Environmental data will be presented in vibrant, interactive and engaging ways, using tools such as info graphics, map based data search and data visualisations (Spotfire) to allow quicker access to data from a range of sources that is easy to analyse and understand.
- Allow the public and communities to better understand the condition of their local and Scotland's environment, and provide information on how they can, individually or as groups, Get Involved with monitoring, protecting, improving and enjoying their local environment.

The web site will be developed further (in the medium to longer term) to provide information that is suitable for Education/Youth users and Specialists

- There will be a specific section of the web site with content designed for young people and education sector users that will reflect the environmental interests of young people and will be closely aligned to the Scottish Learning for Sustainability agenda. The web site will allow easy access to new tools and resources that promote engagement and engender behaviour change in young people, and will support classroom based teaching and outdoor learning projects.
- More detailed data viewing, analysis and download features will be available for those with a more technical interest, in particular decision-makers in Government and the public sector, industry and specialist researchers.

Engaging with users: helping to understand, protect and improve our environment

The web site will do much more than just provide information. It will provide an online platform to help members of the public and schools to understand and proactively engage in positive action on key environmental issues.

- A wider Web Presence will facilitate the spread of information and awareness about the web site and its purpose, and of Scotland's Environment. A social network presence will allow the public to comment on, discuss and share observations on environmental issues.

- Online tools and information will encourage public involvement in the collection of information on the environment and participation in public action initiatives action to protect the environment.
- Parts of the web site will allow users to provide and view their own data on Scotland's environment. This will encourage new ways of analysing and interpreting a wider range of data that could provide new information about Scotland's environment.
- The web site will seek to gather data to measure the impact of website on behavioural change that has a positive impact on the environment.

Sharing Information: streamlining data access and sharing

The web site will adopt or define a common data structure which can be used to efficiently share data between partner organisations and other data users (including European and International data users).

- SEWeb will support and facilitate access to Open Data published by partners in a known form.
- SEWeb will also facilitate the standardised provision of data and information to the web site.
- The web site will maintain a data API (Application Programming Interface) which will allow 3rd party mobile or web developers to easily create applications using the data supplied via SEWeb.
- The web site will develop tools to search, access and share academic environmental research and data, with a much broader non-academic audience.

How will it be delivered: Providing Information in a suitable form

The web site will embrace the rapid growth in the use of new digital technologies, and society's need for instant and mobile access to information, to ensure that environmental data provides useful and interesting information that is accessible by a range of Information and Communication Technology devices

- Establish a full web presence, sharing information, data and information, via a full range of social networks used across the partnership, and across a range of devices, ensuring as many users as possible are exposed to environmental information presented by SEWeb.
- Use social networks and mobile devices as a conduit to share web site users views, observations, data and information with SEWeb and its partners.
- The site will to continue to gather information and engage with users to improve understanding and address the needs of its users and their web preferences to ensure that the best information, services and user experience is provided to all.

What will it deliver: efficiencies, savings and new services

- The website will represent a *shared service* approach developed by public bodies in Scotland. The focus on presenting data and information in a common format via a single infrastructure will avoid duplication of effort and target activity towards the organisations which are best able to deliver specific tasks. For example, providing a single point for the European Environment Agency to access environmental web map data services published by a range of organisations throughout Scotland, for the European State of Environment Report.
- The presentation of a single view of Scotland's Environment will inform the way in which the environment in Scotland is monitored and allowing monitoring activities by public bodies and society to focus on the most important threats.
- The web site will provide tools to access, view, and analyse environmental data, that will in turn provide high quality information to support evidence-based policy development and provide a framework for public bodies and civil society to make decisions and take action. The result will be a more coordinated and, therefore, more cost-effective mechanism for protecting the environment.
- It will be easier to conduct business, research and development that require an understanding of key environmental issues and the quality of the local and Scottish environment. For example, when undertaking environmental impact assessments, the use of tools such as the interactive map search (Land Information Search) and data visualisation (Spotfire) to analyse and interpret data, users will be able quickly to understand environmental impacts, pressures and constraints and where there are environmental resources available to support development.
- Scotland's environmental footprint can be reduced as a result of influencing the actions of society through the provision of high quality online information and resources, and promoting inclusive public engagement, monitoring, and discussion.
- The establishment of a full SEWeb web presence will be of mutual benefit to SEWeb and all partner organisations by significantly extending the scope and impact of key messages, information and data to a much wider audience that may not have been previously been reached.

4.2 Measures of success

This section discusses how SEWeb can measure the success of the website and the web site presence in changing behaviour and attitudes towards Scotland's Environment. Behaviour change is notoriously difficult to measure and almost impossible to prove as the result of a single aspect but the suggestions here allow for a number of aspects to be measured which will at least show the level of engagement with the site.

The first stage is to develop a baseline, essentially this looks at the site analytics to determine what is happing now. What are the most viewed sections of the site, what are the most commonly searched term and the most downloaded documents in the library. These measures

will create a baseline against which the use, and therefore the success or failure, of the site can be determined. Many of the recommendations suggested in this report are for new functionality to be added to the site. As such these measures will have no base line against which to measure, however the SEWeb team should decide on values/targets for these measure which they feel is appropriate for gauging success. The following table describes possible measures, limitations and baseline numbers against which they can be measured.

Measure	**Method**	**Baseline**	**Benefits**	**Limitations**
Page Visits	Site Analytics	Current page visits	Clear indications of which pages are being used by the visitors	Only counts visits, not reason for visit or whether the visitor meant to visit that page.
Information Access	Download counts	Start from 0 after site update	Gives an indication of what type of data people like and are using. A popular document will probably have a good layout style and be important to the visitors.	No real indication of how or why the data has been used. Although downloads could be linked to use. E.g. lots of access to recycling centre info could be correlated to higher use of recycling centres in same period.
Library Document Searches	Search term counting and page access	Start from 0 after site update	Again this will give an indication of what data, information the visitors find important and also what info is being found easily. If the searches for a document far outweigh the page access then that document must have been hard to find.	Easily found documents and popular documents may already be linked to from the home page, so will be found easily. There is no real indication here of whether they found and accessed pages are what has actually been searched for.
Site Referrals	Analytics	Start from 0 after site update	Site referrals should be measured both outward and inward. This will give an indication of how visitors are finding the site, i.e. from partners, searches or social media. Outgoing referrals will show if the site is doing a good job of	There is no way of knowing the context of the referral either in or out and no way of knowing if the user was happy with this referral.

Measure	Method	Baseline	Benefits	Limitations
			advertising the partners.	
Data API Use	API key use	New functionality, no baseline	Monitoring the proposed API system will inform SEWeb about what applications have been created that are using the data the site is providing. The impact of this use can also easily be determined; a wide reaching important application will have more impact than an unknown little used one.	There are little drawbacks to monitoring API use as long as the success is not solely judged on the number of uses but that the quality of accessing application is also taken into account. A poor application will not reflect well on SEWeb.
Citizen Science Access	Analytics	Start from 0 after site update	Higher use of citizen science pages and support information can be directly correlated against engagement and response to specific initiatives. If high use of citizen science pages can be linked to a greater submission of data this shows that the pages are engaging the users.	Pages visits must be correlated with other factors to show any change of behaviour or engagement.
Data Uploads	Social media and site upload counts	New functionality, no baseline	Linked to above measure. The amount of data being uploaded shows the level of engagement within the public for the initiative.	The quality of the uploaded data must be checked. Again sheer volume should not be counted as success if the data is not of sufficient quality to include on the site.
Social Media engagement.	Social Media stats	New functionality, no baseline	The number of Posts by SEWeb can be compared to the number of followers, page likes, watches,	Again the quality of the posts and comments need to be taken into account. If the comments are negative this may not

Measure	Method	Baseline	Benefits	Limitations
			views, mentions, comments and other posts can all be easily counted to show how far the web presence has spread. Engagement can be determined by the number of users actively commenting on posts and status's posted by SEWeb.	reflect on the success of the site. A good measure would be to look more at the reposts and mentions, this requires a higher level of interaction and a user is unlikely to do this unless they actually like the site and want their own contacts to look at it.

Table 3 : Table showing possible measures of success

The measures shown in table 3 show some of the quantitative measures that can be taken to determine the web site successes, many of these measures need to be combined with more qualitative measures of user experience to fully determine the sites success. This will require a regular repeat of the web site survey to see how user preferences are being addressed and how/if the user's preferences have changed.

4.3 Prioritised Recommendations for the development of SEWeb Web site

This section takes the findings from the survey and workshops, and all of the recommendations made (and highlighted) throughout the report and prioritises them into short, medium and long term development opportunities for SEWeb The sections the recommendations appear in depend mainly on cost and time taken to achieve but also account for the level of impact the measure will have.

4.4 Short Term Recommendations

These short term recommendations are processes that can and should be implemented immediately for the biggest impact; if these recommendations are not implemented quickly opportunities for the site may be lost. None of the recommendations here are prohibitively expensive in terms of man hours or development cost. It is not envisaged that SEWeb would need to employ extra staff to achieve these goals.

4.4.1 Define Site Name & Brand

As has been highlighted in the previous sections there is confusion among the sites potential users as to what the site is actually called. The confusion is reinforced by the multiple different names the site is called both within the partner organisations, the steering group and on the site

itself. SEWeb must choose a name that it will use in all future references, at least publicly. This will ensure that potential users are able to find the site and are able to effectively share knowledge about the site via a single identity. The name chosen for the site should represent what the site stands for, be distinct and easily recognizable.

Both the measures suggested here will also increase the findability of the site on search engines such as Google. The sites should however make more use of search engine optimisation techniques, part of this will be to ensure that the partners sites link to SEWeb and that appropriate key words, both specialist and general, are used to identify the site. As suggested in further recommendations the suggested use of social media will allow this single identity to spread.

4.4.2 Ensure purpose of the website is clear to the user

The purpose of the site is clear, to allow access to information about and increase engagement with Scotland's Environment. This however may not be clear to visitors to the site. Recent updates to the site seem to have moved in this direction but the sites purpose is still not galvanised into a single easily understood statement. Visitors to the site must understand immediately what the site is for if they are going to stay and use it. Commercial consultants such as Atkins (www.atkinsglobal.com) and Aecom (www.aecom.com) get their purpose across to new visitors well by combining engaging statements with appropriate imagery, SEWeb partners BGS and JHI use a similar approach, doing a good job of getting their site purpose across to the user with out front loading the site with large sections of text (as SEWeb currently does). SEWeb already has a clear site purpose as a gateway to Scotland's environment; and this should be enough for the user to work out what the site is for. Figure 4.3 below shows where JHI have included their site purpose within their google search result, the words "science connecting land and people" and "world leading institute for land, crops, water and the environment" are clear here so the visitor knows what the site is about before they click the link. The current SEWeb search text does somewhat describe the site, but is so long that it has been truncated, SEWeb needs a much shorter statement here to be effective, "Gateway to Scotland's Environment" would be appropriate.

Figure 4.3: SEWeb and JHI google searches showing site purpose

4.4.3 Provide a mobile friendly alternative

Mobile internet use has dramatically risen in the last year and is predicted to rise even more sharply in the months to come. The number of people using the internet via mobile devices such as tablets and smart phones will overtake those accessing the internet from desktop machines in

the next two years. If SEWeb does not provide these users with a way of adequately accessing the provided information via these devices they will not use the site.

Suggestions should be taken from similar approaches by other organisations, including SEWeb partners such as the BGS, to arrange appropriate material and display methods for the mobile based sites. The Mobile sites need not display all information and not in great detail, mainly up-to-date headline information with links back to fully background data on the main site would suffice. The Mobile site should also include aspects of more advanced functionality available in mobile devices, simple approaches should include utilising mobile GPS to provide local information for tools such as WIMBY.

4.4.4 Start to develop a presence on social networking sites

Social networking will provide SEWeb with the opportunity to increase its web presence. SEWeb already provides limited news updates on its current site (RSS feed from the Scottish Government web site), even though these link back to the partner sites that provides the RSS feed , they provide a constant channel of news about the environment which could be posted on a SEWeb Facebook page or twitter feed. This will allow other organisations to link with SEWeb via the social network and increase awareness of the site among currently untargeted groups such as the younger generation. If someone wants to find information about the environment they may have already heard about SEWeb via Facebook. Site updates and new features can also be advertised via these channels.

Initially SEWeb should target Facebook, as the largest used UK network, by creating a dedicated SEWeb page on this network and linking to the SEWeb partner pages. Site updates, latest news and environmental events, particularly citizen science and volunteer opportunities should be posted here. SEWeb should also make use of dramatic images of Scotland's environment to initially help spread knowledge of the site. The use of these images on social media sites will attract users back to the main site. These measures combined will cement the existence or the site to the target users.

4.4.5 Agree SEWeb's user base

SEWeb should commit to a single target user group for immediate / short to medium term SEWeb future development (within the scope of LIFE funding term) – this is critical to ensure all products being planned and under development – meet the needs of the target user group, and maintain focus. Generalists/non specialists, with an established level of general knowledge and interest in environmental issues (not people that have no interest or knowledge of the environment), especially aimed at the younger to middle age groups, will provide the biggest impact here in terms of providing a novel purpose, greatest potential behaviour change and engagement with the information.

4.4.6 Dynamic information updates

SEWeb needs to provide regularly updated, dynamic content that will keep users coming back to the site. This should particularly include aspects of the environment where the generalist user

can get involved, such as citizen science or events taking place in the environment. This information need not be crafted from the site but could be sourced from external feeds from partner organisation's sites or their social networking feeds.

The BGS site provides a good example of where twitter posts tagged with @BritGeoSurv are automatically presented on the home page, this provides its users with quick access to currently occurring events. SEWeb could adopt and extend this approach to link to trending information from current environmental conferences including webinar links and other social media information. As SEWeb will not produce its own information it is vitally important that it ensures the data its does display is up to date, this can be achieved by feeding the news and event from other partners.

4.4.7 Become a trusted source for data

The workshops performed showed that currently there is no unique for single source trusted unbiased environmental information about Scotland. SEWeb has a unique opportunity to provide this trusted source. SEWeb can become a curator of the data about Scotland's Environment, ensuring that users of the site can access information and data from trusted organisation and data providers. SEWeb can act as a mark of quality which data providers will wish to obtain, once this process evolves SEWeb or the chosen name will become synonymous with good trusted data, further strengthening the name and purpose of the site.

4.5 Medium Term Recommendations

These medium term recommendations are processes that will take longer to achieve but will still fall within the overall project timescale (less than 3 years). These recommendations will require redevelopment of the website and further development to provide the new functionality. The functionality suggested here may require expertise outside the current SEWeb Development team.

4.5.1 Provide an educated search engine

Specific scientific terminology causes issues in both searching for and understanding information. Users of the workshops found it hard to find information when they were not using the correct terminology as the search keywords. SEWeb should implement an intelligent search system, utilising a search engine frame work similar to Google site search APIs, which will allow users to find information based on much simpler keywords. The implementation of the search system should learn what works are commonly used for more technical terms allowing new users to find information even if they are not using the correct terminology.

The Direct Scot (http://www.directscot.org) is already developing a learning search engine that's framework could be utilised by SEWeb to provide similar functionality. Further development and optimisation could be included to allow the search to suggest pages where other users have finally been directed to for particular searches. This could be extended to searches performed on partner sites although each partner would need to agree to use a single search system, similar to

the system Direct Scott is implementing, this would not be a trivial exercise and is more likely to be a long term aspiration.

4.5.2 Provide access for different uses

There are a number of different reasons why users will visit a site however these will generally fall into three main categories. Specialists who are using information for research or decision making, generalists using information to find services, facilities or general interest and young people/educators finding information for teaching and learning purposes. Users accessing information for these three uses will want to access the information in differently. Experts will generally know what they are looking for and want clear access to it. Non-experts will want information pertinent to them with easy to understand terminology. Educators will require a particular style of information that is suitable for a range of students to understand. It is also important that SEWeb continues to develop its links with young people and includes them in any development of a youth based site.

To provide this level of access to all the user types SEWeb would need to improve understanding of the data/information types and data use functionality that each user group prefers. This would require more workshops with specialist users to determine more detailed user information than has been gathered for the purposes of this report. In particular educators require particular information and have a need for quick, guided navigation to data related to national curriculum topics and technologies to support outdoor learning.

Once the different levels of access have been established for different types or use/user and the content for each created it would be beneficial for the user to be able to customise their experience. In simplest terms this could be achieved by allowing the user to define what type of information they are looking for; specialist, generalist or education. More advanced customisation could be developed to allow a fuller user experience using a similar approach to the met office website (as shown on page 37).

4.5.3 Provide information in engaging and interactive forms

Interactive access to the information provided by the websites will ensure the continued relevance of the site and buy in from the next generation of users. Both expert and non-expert users specified a desire to interact with the data on the site in both geographic and graphical forms. SEWeb is already investing in the Spotfire data analytics system, this investment and development should continue and will provide the site with a flexible, interactive data system which a wide range of users will be able to use.

The USGS Earth Explorer (http://earthexplorer.usgs.gov/) provides a good example of where an interactive system can be used to allow visitors to define what information they want. The emerging SEWeb product, the interactive map search tool will provide a similar functionality, with users being able to draw an area of spatial interest on a map, and then calling up the relevant environmental information (sites of interest, environmental pressure points, sensitive receptors etc) within a defined proximity to the area of interest/search. Provide specific data based on development type/interest, and on a user defined area of search, and signpost to

contacts and expertise within organisations that are responsible for protecting and monitoring the environmental points of interest.

The Eurostat database (http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/) shows how non-geographic data can be clearly categorised and themed to allow for easy searching and data sourcing. Eurostat also displays links to the most popular and the most recent data on the home page again easing searching for topical data. Along with the databases there are separate reports describing and summarising the raw data, this again allows the user to quickly determine what type of data they want and in the format they want.

As well as providing information in interactive forms SEWeb should introduce the use of info-graphics to provide a simple and visually pleasing method of displaying complex themes to the generalist user. As shown in section 3.2.5, info-graphics can be used to effectively represent complex data, there are thousands more examples of good info-graphics at visually (http://visual.ly) at site that host and rates good info-graphics. Info-graphics however cannot be automatically generated and SEWeb would need to employ a graphic artist to produce graphics which are of a sufficient quality to engage the visitors.

4.5.4 Provide a user acceptable geographic data system

SEWeb should look seriously at addressing the problems identified with its current map based data provision. The maps were identified as being particularly important to the users but their current implementation does not provide the functionality or level of service the user's desire. It is recommended that SEWeb looks at an open source system such as openstreetmap (www.openstreetmap.org) or mapnik (www.mapnik.org) on which to base their geographic data display. These open sources systems will provide the user experience the users demand allowing SEWeb to focus on the data layers provided.

The National Marine Plan Interactive (http://marinescotland.atkinsgeospatial.com/nmpi/) is an excellent example of an interactive mapping system which fluidly allows a high level of user interaction whilst still presenting scientific information. The NMPI is based on the openstreetmap framework and has been adapted to display the information required for marine planning. SEWeb should use this as an example on which to base its mapping system

The navigation and layout of any new system must also be taken into account, one of the major problems with the current mapping functionality available on the site is that there is little context to describe the information that is being displayed. Currently the site relies on visitors viewing the information on the site before viewing the data on the map, and there is little linkage between the two. It must be ensured that the information and data on the site are presented in context with clear linkages between what is being presented and its meaning. This not only applies to the mapping tools but equally to any data presentation the site uses in the future.

4.5.5 Ensure the accessibility of the website

Web accessibility is extremely important, the design of the site should be continually checked to ensure it not only passes the various guidelines inequality of access, but also that the accessibility

features are implanted correctly. Basic problems such as an image not containing an alt tag, a piece of txt not being recognised by a screen reader or a link not being reachable via keyboard will greatly reduce a disabled users experience of the site. A full accessibility analysis was performed on the current site (using the AChecker Software http://atutor.ca/achecker/), whilst this highlights that there are no major problems (i.e. legal issues), it does show that a number of issues which could affect the user experience of a functionally impaired visitor are overlooked.

4.5.6 Mobile Apps

The creation of mobile apps is a natural extension of the creation of a mobile friendly website, for example mobile apps supporting Citizen Science and to encourage user generated data on SEWeb. The mobile apps should be developed to use the functionality of the mobile device including the camera and the GPS, these apps can be set up to connect with the SEWeb social networking sites (initially Facebook) to allow the users to begin to share user generated content. This also starts to create a community around the SEWeb social networking pages. The development of these initial apps would most likely require new skills to be added to the SEWeb team to create and maintain any software created in-house. Alternatively this development could be done with the existing mobile development sector in Scotland or developed as part of an App Jam (http://2010.appjam.eu/) or development competition. At this stage there is no provision for external developers to access the data provided by SEWeb as the data access API will not have been developed. Further recommendations below highlight how the data access API will allow SEWeb to develop a framework for external developers to produce applications which access the site data and present it in more creative ways.

4.5.7 Stream lining data exchange

Environmental websites in general hold large amounts of information in different file structures, formats and levels of detail. Currently information in this form will be difficult to share efficiently as the data must be converted to appropriate type for each organisation. SEWeb should look at streamlining this process by adopting or developing a standard content format for data exchange between SEWeb partners or by providing a brokerage system where the different formats are converted to a single style to be passed to the requesting site. Once this has happened the automatic transfer of information between sites becomes much easier to implement as the data formats are known and can be processed effectively. When new sites wish to access or provide info for SEWeb they can be supplied with the data structure and will immediately know what data needs to be provided. Any external sites or organisations such as EU partners will also be able to process any SEWeb data using this standard format.

4.5.8 Develop resources specifically for teaching and learning

Providing effective and appropriate teaching and learning materials to educators of students of all ages SEWeb has the opportunity to make a large impact in the student's engagement with the environment. However to ensure the information is provided in an accessible, appropriate form that meets the requirements of the current education curriculum, SEWeb will need to maintain a deep and continual dialogue with the educators. This may not be possible without further funds

to sustain the connection with the education profession and ensure that he material continue to be relevant to the curriculums.

4.5.9 Provide information about "enjoying the environment"

SEWeb should have more info about "enjoying the environment" this is supported by the web site survey, the workshops and public web user research. SEWeb needs to have information about which actually takes into account what their target audience is interested and not just about the state/quality of Scotland's environment. By providing up to date information about event, activities and locations that people can use to get involved in the environment the site not only provides the "hook" to get visitor to look at and stay on the site, but also if they are enjoying the environment they are also more likely to want to protect it.

4.6 Long Term Recommendations

These long term recommendations are processes that will take much longer to achieve, longer than the current project lifetime, but will have far reaching impact. These recommendations will require redevelopment of the website and extensive further and continued development and maintenance to provide the new functionality. The functionality suggested here will require expertise outside the current SEWeb Development team.

4.6.1 Provide Data Access API access to developers

The development of a data API will allow SEWeb to allow access to the data it provides to third party developers. This will increase interaction with Scotland's environment through the provision of good quality data which can be used in ways SEWeb may never have considered or been able to implement. As previously mentioned SEWeb should initially create some simple apps to act as examples for external developers to connect with the data provided by the site. This is a similar approach to that taken by organisations such as the Guardian Newspaper (http://www.guardian.co.uk/open-platform) that provide a open platform for any developer to use the data they provide and the US EPA (http://www.epa.gov/developer/ef_api.html) who provide a RESTFULL API to their data. The process of creating a data API is not trivial and will require substantial investment both in development and capital to achieve. Some of the cost may however be recouped through providing commercial access and the process would add to the strength of Scotland's Digital Economy agenda. The data API would however require continual management and maintenance to ensure the data remains available and is not misused.

4.6.2 Full development of Web Presence and Social Media

The creation of a social media presence is suggested as a short term goal to provide SEWeb a way of disseminating information and creating backlinks to the site. An initial short term recommendation is to create a profile on the most popular networking sites for the biggest impact, however a much wider web presence could be achieved through the creation of a full

social network based web presence implementing blogs, news items, videos, photographs and other media about Scotland's Environment once this initial presence has been established. Much of this outward spread of information can be automated through blogging system such as WordPress and MediaWiki where updates and summaries are posted across the networks and link back to the main site. However a social media presence of this scale, including new blogs, YouTube videos and new images would require the continued creation of new material and continual monitoring of how the information was spreading across the networks.

4.6.3 Further interactivity and user generated content

If SEWeb is to continue to attract users and younger users in particular to interact with the environment it must find new ways of providing the hook that will keep these users interested. Web based 3D visualisation systems based on WebGl technology may have the ability to provide thins level of interest. As part of the site future development SEWeb should look at utilising these kinds of technologies to accompany their existing data mining and map based displays.

As well as new ways of displaying the information to the users SEWeb needs to fully support public engagement with the environment by allow the users to collect and upload their own data through citizen science initiatives. This should include both geographic map layers and raw data, to allow the users to have a stake in the website by providing some of the data allows access to. There are issues here with quality control to ensure the data is appropriate and accurate. This is especially important if SEWeb is to maintain its trusted brand. Peer control, such as that employed by Wikipedia, is one option for maintaining the quality of the posted data, however this relies on educated users checking the posted information and this may not always be possible. Another possibility would be to create a dedicated user generated daughter page which could contain a caveat that the data comes from user sources (similar to forums on many sites) however this would still need some level of moderation by a member of the SEWeb team.

ANNEX

1 SEWeb Web Site Survey Questions (October 2012-January2013)

Thank you for choosing to take the SEWeb Web Site Survey. It should only take a few minutes of your time and the feedback you provide will be extremely useful to the web team to help us provide you with the web information and services that you need.

1. What best describes you? *(tick one option only)*

- ↑ Member of the public
- ↑ Government
- ↑ Public Sector Agency
- ↑ Local Authority
- ↑ School (student)
- ↑ School (teacher)
- ↑ Academia/University (researcher)
- ↑ Academia/University (student)
- ↑ Academia/University (lecturer)
- ↑ Business/Industry
- ↑ Not for Profit Organisation/Third Sector
- ↑ Media
- ↑ Other (provide detail) .....

2. Are you interested in the environment ?↑ Yes ↑ No

3. Why are you interested in the environment? *(please tick all options that are applicable to you)*

- ↑ Enjoy (e.g. recreation)
- ↑ Understand (e.g. data / monitoring)
- ↑ Protect and Improve (e.g. action / enforcement / policy)
- ↑ Livelihood (e.g. your place of work/business is reliant on the environment)
- ↑ Other (provide detail) ……

4. Which environmental topics are you most interested in? *(tick all that are applicable to you)*

↑ Air Quality ↑ Climate Change

- ↑ Noise, Light & Odour
- ↑ Cities, Towns and Green Space
- ↑ Land Use & Management
- ↑ Soils
- ↑ Timber and Forestry
- ↑ Benefits from Nature
- ↑ Recreation and Amenity
- ↑ Rivers and Canals
- ↑ Estuaries
- ↑ Scotland's Seas
- ↑ Wildlife – Farmland and lowland
- ↑ Wildlife – Rivers and Lochs
- ↑ Wildlife – Woodlands and Forests
- ↑ Historic Environment
- ↑ Landscape
- ↑ Rocks and Landforms
- ↑ Fossil Fuels and Minerals
- ↑ Waste
- ↑ Health and Wellbeing
- ↑ Groundwater
- ↑ Lochs
- ↑ Coastal Waters
- ↑ Wildlife – estuaries and seas
- ↑ Wildlife – Mountains and uplands
- ↑ Wildlife - Wetlands
- ↑ Environmental monitoring
- ↑ Other*(provide detail)* ……..…….....

5. Why did you come to the SEWeb web site? *(tick all that apply to you)*

- ↑ General interest
- ↑ Information and data on a specific topic
- ↑ Information and data in a specific geographical area
- ↑ Research
- ↑ Environmental publications
- ↑ **News and events**
- ↑ Community action
- ↑ Contact details of other organisations
- ↑ Other *(provide detail)*…….....

6. How did you hear about SEWeb ? *(tick all that are applicable to you)*

- ↑ Internet Search Engine (e.g. Google)

- ↑ Leaflet
- ↑ Article
- ↑ Event
- ↑ Meeting / Presentation
- ↑ Word of mouth / recommendation
- ↑ Referral from another web site
- ↑ Facebook
- ↑ Twitter
- ↑ Other (provide detail).....

7. How often do you visit the site?

- ↑ This is my first visit
- ↑ Several times a week
- ↑ Several times a month
- ↑ Every day
- ↑ Less than once a month

8. What type of device do you use to access the site? (tick all that are applicable to you)

PC / Laptop (at home)	↑
PC / Laptop (at work)	↑
Tablet	↑
Smart Phone	↑

9. Please rate your experience using SEWeb on the devices that you use

	Very Good	Good	Average	Poor
PC / Laptop (at home)	↑	↑	↑	↑
PC / Laptop (at work)	↑	↑	↑	↑

Tablet	↑	↑	↑	↑
Smart Phone	↑	↑	↑	↑

10. How likely are you to:

	Very likely	Likely	Unsure	Not at all
Return to this website?	↑	↑	↑	↑
Recommend this website?	↑	↑	↑	↑

If unsure or not at all, we'd like to hear why ?

11. What do you like most about the web site

No comment↑

12. What do you like least about the web site ?

No comment↑

13. What pages of the SEWeb web site do you use the most

	Always	Frequently	Sometimes	Never
Homepage	↑	↑	↑	↑

Our Environment	↑	↑	↑	↑
Library	↑	↑	↑	↑
Map	↑	↑	↑	↑
Citizen Science	↑	↑	↑	↑
Trends & Indicators	↑	↑	↑	↑
Sectors & Issues	↑	↑	↑	↑
Life+ Project	↑	↑	↑	↑
Not applicable – I'm a first time user	↑			

14. Please rate the SEWeb web pages to help us improve

	Excellent	Very Good	Good	Average	Poor	No Comment
Homepage	↑	↑	↑	↑	↑	↑
Our Environment	↑	↑	↑	↑	↑	↑
Library	↑	↑	↑	↑	↑	↑
Map	↑	↑	↑	↑	↑	↑
Citizen Science	↑	↑	↑	↑	↑	↑
Trends & Indicators	↑	↑	↑	↑	↑	↑
Sectors & Issues	↑	↑	↑	↑	↑	↑
Life+ Project	↑	↑	↑	↑	↑	↑

15. Did you find what you are looking for on SEWeb ? Yes ↑ No ↑

If no, what information couldn't you find :

16. Do you use other sources of environmental information ? Yes ↑ No ↑

If yes, please provide some examples of other sources of information

17. Please enter any comments you have for any changes, additional features or improvements would you suggest for the website here

	Comments
Homepage	
Our Environment	
Library	
Map	
Citizen Science	
Trends & Indicators	
Sectors & Issues	
Life+ Project	
New Ideas for SEWeb –	
Information, Data, Pages	
Features	
No comment	

Any other general comments you would like to make about SEWeb:

To help us share information more effectively, we would also like to know more about how you use different forms of communication – could you spare another couple of minutes to answer these questions

Yes Ⓘ No Ⓘ

Do you use social media? Yes Ⓘ No Ⓘ

What do you use to find/access information?

	Always	Frequently	Sometimes	Never
Mobile Phone	Ⓘ	Ⓘ	Ⓘ	Ⓘ

Tablet	↑	↑	↑	↑
Computer	↑	↑	↑	↑
TV	↑	↑	↑	↑
Radio	↑	↑	↑	↑
Newspaper	↑	↑	↑	↑
People	↑	↑	↑	↑

How do you communicate information ?

	Always	Frequently	Sometimes	Never
Email	↑	↑	↑	↑
Social Media *(e.g. Twitter / Facebook)*	↑	↑	↑	↑
Instant Text Messages *(e.g. SMS)*	↑	↑	↑	↑
Voice Call	↑	↑	↑	↑
Post	↑	↑	↑	↑
Face to Face	↑	↑	↑	↑

How do you prefer to receive information about news, events or information related to your interests ?

	Always	Frequently	Sometimes	Never
News/Journal Articles				
Radio features				
Email	↑	↑	↑	↑
Mobile Phone App				
Social Media (e.g. Twitter / Facebook)	↑	↑	↑	↑
Instant Text Messages	↑	↑	↑	↑
Post	↑	↑	↑	↑
Face to Face	↑	↑	↑	↑

If you would like to receive further information about SEWeb please provide us with your contact details

Name…….

Organisation……..

Email address……

Thank you very much for taking the time to complete this survey. The answers you have provided will help us to continually make improvements to the web site and the information it holds, ensuring that you get the best possible experience when visiting Scotland's Environment Web.

If you would like to contact the SEWeb Team, please submit your query to "**Contact Us**" (accessed from the Home Page)

2 Full Workshop Agenda

Session:	Potential Users Session, Dundee	**Day:**	One of 3rd and 14th December 2012, 11.00 to 13.00 at University of Abertay Dundee, SRO meeting room.
Topic:	**Accessing Environmental Information**		
Rationale:	The rationale behind this workshop is primarily to gain an understanding of how the potential users of the SEWeb site currently find and access environmental information. Through the use of practical scenarios the researchers will see firsthand how the participants go about finding the data they are looking for. This will include what types of site they visit, which search techniques or engines they use and more importantly what hurdles they face. The use of mobile technologies in the workshop will allow the researchers to identify how the potential users feel about accessing the data in this way. The design session will allow the researchers to understand the presentation and information management styles that the different users prefer. The workshop is designed to find ways to take the SEWeb development in a direction that will provide the most benefit to its potential and current users. It is not the purpose of the workshop to identify problems with the current system.		
Duration:	120 Minutes		
Objectives:	There are three main objectives to this workshop; To gain an understanding of how potential users of the SEWeb site currently find the environmental data they need. To determine if there is an appetite among the potential users for a wider web presence for SEWeb including access through mobile devices. To investigate different user type preferences for web information portal design.		
Workshop preparation:	The focus group and workshop participants are asked to complete the survey on the SEWeb site before attending.		
Facilitators	Abertay Staff: Santiago Martinez, John Isaacs, Alison Duffy. SEWeb Staff:		

Session Structure	**Welcome and presentation on SEWeb Project goals. (10 minutes)** **Breakout Group Session 1 (4-6 members) (30 minutes)** Each of the groups will be given a scenario where they need to look for specific pieces of environmental information. The information they require will be available on SEWeb or on one of the partner organisations websites. The goal of this session is to gain an insight into how and where the participants currently look for data and any common problems they have accessing the data they need to find. **Breakout Group Session 2 (4-6 members) (10 minutes)** This session will look at the current state of data accessibility via mobile technologies. Participating groups will be supplied with an iPad or Android tablet and asked to find a specific piece of environmental information, again the information will be available on the current SEWeb site or partner organisations. The goal of this session is to determine what kind of mobile access the stakeholders would like to environmental information. **Breakout Group Session 3 (4-6) members (30 minutes)** This session will provide the participants with an opportunity to design how they would like their information presented. Using physical props the groups will be able to build up a webpage which represents how they would like to access the data they need, what sections a information portal page should have and how they would like to navigate such a page. **Round up (20 -30 minutes)** The round up will cover what has been discussed by the separate groups throughout the session. This will highlight common issues between the groups and hopefully inform them about the work and purpose of SEWeb and its wide range of potential users. **Q & A (10 -20 minutes)** This final section gives us an opportunity to ask any questions which were not covered in the survey or fill any gaps which have been identified from the survey responses. It will also give the participants an opportunity to ask us any questions and highlight any issues in data access they think we have not covered.

3 Information Sourcing Scenarios

Flooding Information Search

You live in a small town in Scotland called Dura Den which has not had flooding problems in the past. However, very recently as a result of prolonged rainfall, flooding occurred which had catastrophic results: with infrastructure collapsing and several families trapped in their homes. As flooding has never really been an issue before you did not consider heavy rainfall as a threat to your daily life. You want to prepare and protect yourself and your family in case anything like this happens again.

1. Try to find out why this happened in your village from an official source (not a newspaper)

2. Where can you find out information about preparing for and protecting yourself from flooding events?

3. What helplines are available?

4. If you don't have a computer, what other media forms could you access?

To landfill or incinerate….

You have been asked to develop a discussion document for your local community task group which investigates domestic waste disposal routes in your area. The two most common methods in the UK are the historical solution of sending waste to landfill and the newer and fast becoming popular alternative of incinerating waste. You wish to know what the advantage and disadvantages are of each solution. You are also very interested in locations of these sites in Scotland and intend to provide a few case studies which highlight positive and negative issues experienced by other communities. Choosing the category which most describes you, make a list of your sources including communication type which provided you with information for the discussion document.

a) Student (school, under / post graduate)

b) Public / Government (local / national)

c) Teacher / academic

d) Business / industry

e) Environmental consultant

f) NGO

g) …..

Scotland's Land use strategy – What is it?

The Scottish Government recently published a Land Use Strategy for Scotland. This exercise will explore some of the Land Use Strategy objectives in greater detail, particularly those that will affect you and your children during the next 30 years. Making a note of the different organisations' websites that you come across, try to briefly answer these questions:

1. What is the key aspiration of the land use strategy? (Sustainable land use) and what are the key objectives. Why are they important?

2. List the different types of land use in Scotland including those areas which deliver multiple benefits in order to achieve the best outcomes from our land resources.

3. What are the predicted land use changes over the next 30 years?

4. Map key land uses on a:

a. national basis (Scottish)

b. regional basis (i.e. chose a Scottish region – Glasgow and Clyde Valley, Highlands and Islands, Tayside etc).

4 Persona Templates

Industry Regulator

Gillian

Spends 3h average on daily web searching

Better ways of searching on documents

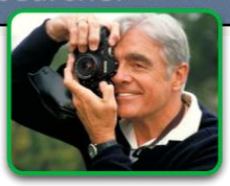
High School Teacher

Alastair

Needs material for his lectures

Own youtube channel about Scottish Geography

Photographer & Researcher



Wallace

Shares and contrast data with other researchers

Willing to share his knowledge and experience of nature photography

Retired Florist

Lorna

Wants to grow plants from distant countries

Willing to use new technologies if it is worth it

Secondary School Pupil

Has to do a presentation about renewable energies

Piotrus

Enjoys playing educational games with other friends from Scotland & Poland