EnviLOD Work Package 2— User Feedback Report

Executive Summary

This deliverable describes the user feedback received during two evaluation sessions, carried out towards the end of the 7 month long EnviLOD project. The first smaller user evaluation session was held internally at HR Wallingford and was used as an initial test of our semantic search user interface (UI). Following this, some minor adjustments were made to the UI and it was presented at a much larger user workshop, held at the British Library five days before the end of the project. The core of this deliverable will focus on the outcomes of the second, much larger user evaluation.

Overall, workshop participants found the EnviLOD semantic search UI easy to learn and use. The group discussions and the three written feedback questions on the survey forms allowed us to elicit a number of small, easy to implement changes to the UI, which we hope will lead to improved usability in the future. We are planning to implement theseduring follow-up research and then carry out a second user-based evaluation, this time with users recruited online, who will not be shown a demonstration of the semantic search in advance.

In addition, we also elicited a number of more challenging ideas for future improvements, which cannot be easily addressed within the scope of short, informal follow-up work. The most substantial of these include the implementation of a natural language interface, map-based visualisations, support for user feedback on search results and searchquery refinementfor example. These are all valuable possible extensions to this work, including building a natural language interface (see (Damljanovic et al, 2013) for some preliminary work which we have done on this already). However, to fully address these, a much longer and larger, two or three year project would be required.

Lastly, a known limitation of this evaluation which could have impacted on our results came from the limited amount of content which we could index in the experimental system. This was due to copyright issues with the majority of environmental science content at the British Library. Due to this limited content, participants were not always able to judge how comprehensive or accurate the semantic search was, especially if compared against results offered by Google. Since the British Library isnow planning to integrate the EnviLOD semantic enrichment tools within the advanced Envia Labs functionality, future work on this toolcould potentially be able to evaluate on this morecomprehensive data, through the Envia system.

1. Introduction

Environmental Science is a broad interdisciplinary subject area that spans biology, chemistry, earth sciences, physics and engineering. Because of the breadth of the subject scope, information discovery and sharing in environmental science is often a challenge, as it lacks a standardised resource description framework, such as the MeSH headings in biomedical sciences. Linked Open Data and vocabularies offer an opportunity to improve the process of information discovery and

sharing through unique, machine readable interlinked open vocabularies, ultimately connecting users more efficiently to useful and relevant sources (Heath and Bizer 2011).

The overall aim of the EnviLOD project is to demonstrate the value of using Linked Open Data vocabularies to the field of environmental science. In order for this value to be effectively demonstrated, it is necessary to understand not just what the vocabularies are capable of doing for information discovery in environmental science, but understanding whether those capabilities match the needs of users of environmental information. To that end, Work Package 2 represented an effort to develop detailed requirements from a user perspective.

In this context, a 'user' is defined as a 'user of flooding information', whether a researcher or practitioner. The flooding community stretches across a wide variety of sectors, including academia, consulting engineers, internal drainage boards, government agencies, local government, and charities for example. Naturally, the roles of individuals in these sectors vary substantially, and as such their information needs are different, as may be the ways in which they discover information.

Students and academics are primarily interested in basic to advanced academic literature including text books on physical processes and flood management,and also scientific papers depending on theirrequirements. These needs can cross all areas of flood risk management and science. Consulting engineers require guidance and best practice documents as well as examples of case histories, primary data for consulting studies as well case location specific information.Government Agencies require similar information to engineers but also are interested in the research into and provision of best management and methodological approaches to flood risk management and also in local regional and national statistical information on flooding. Local government users are mostly interested in flood risk in their local area – including event histories and flood hazard and risk mapping. Charities such as flood forums are also more locally focused and require information on local flood risk and mitigation options – such as flood protection products. However these groups are also involved in championing and canvassing local authorities for flood defence funding for their local areas – so they also are interested in flood management at the local level.

In understanding the applicability of Linked Open Data vocabularies to the discovery of flooding information, it is necessary to understand the vocabularies that the different parts of the flooding community use when searching for information. The aim was also to understand what commonalities exist in the needs of information users across the flooding community in order to determine where support might be most effectively targeted.

Thus it was established that from a technical perspective, it is important to understand what users search for, how they phrase their queries, and their expectations on the content retrieved in order to demonstrate the utility of vocabularies to the community.

2. User Groups Consulted

During the EnviLOD project users were consulted in three phases:

1 User requirements scoping;

2 HR Wallingford Knowledge Exchange session;

3 British Library dissemination workshop.

2.1 User Requirements scoping

In order to scope requirements for the EnviLOD search tool, it was important to understand the needs and search behaviours of its potential users. Users were contacted via personal contacts and environmental science networks. A total of 34 respondents answered the survey, which could be split into Local Authority, Consultancy, Academia, NGO/Charity, Government Agency and SME (business). There is a slight emphasis in responses from local authorities due to the survey being posted on the FlowNet website, which provides resources and a point of interaction for that group. The results of the user requirements scoping are detailed in (Kieniewicz & Wallis, 2013).

2.2 HR Wallingford Knowledge Exchange Session

HR Wallingford, an environmental consultancy specialising in water and one of the EnviLOD partners, holds internal Knowledge Exchange sessions where HR Wallingford staff share experiences and results from their research projects. The EnviLOD project was invited to give presentation and demonstrate the search interface to researchers and practitioners. This took place on January 16th, 2013 in Wallingford.

Thirteen attendees participated in the HR Wallingford testing session. They comprised experts in hydrological modelling, flooding, and environmental informatics. All could be considered potential 'users' of the EnviLOD search tool.

2.3 British Library Workshop

A workshop was held at the British Library to disseminate the results of the EnviLOD project, and contextualise the outputs of this project within other efforts in environmental informatics from the NERC Centre for Ecology and Hydrology (CEH) and others. 23 external participants attended the workshop, who could be broadly broken down into environmental scientists (43%), users interested in applications of this technology to other domains (22%) and semantic technology developers (35%). The environmental scientists amongst the group were all users of environmental information, but also had roles that led to an interest in the potential of Linked Data in environmental sciences.

3. User Needs Addressed/ Use Cases Evaluated

In brief, users indicated the types of queries required to meet their flooding search needs. With respect to topics, this included regulation and policy; research; risk; and spending. Regardless of the topic searched for, many of the queries were location-based. In terms of searching methods, keyword-based searches were preferred amongst the respondents.

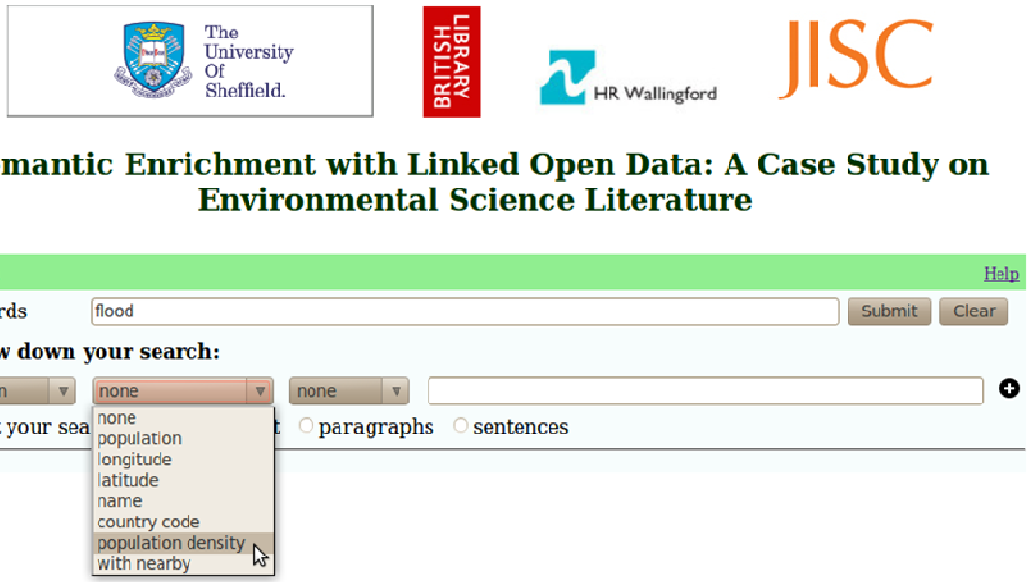
Unfortunately, Google-like keyword search based on full-text indexes is not able to answer location-based queries, such as "Flooding in places with population less than 15,000 inhabitants" or "Flooding near Sheffield". This is due to the fact that the required knowledge is not present in the textual documents, i.e. the population numbers for each location, distances between locations to identify which ones are "near" (i.e. within a given number of miles of each other). Similarly, lack of knowledge on administrative regions results in missing search results. For example, searching for "climate change Oxfordshire" returns no results, even though there are documents mentioning Banbury and Wytham Woods.

Consequently, the following three classes of queries were identified as important use cases for the application of semantic technologies to information discovery in environmental science in EnviLOD.

3.1 Returning results for geographically specific queries

Beyond keyword recognition, this use case includes proximity and recognition of geographic entities that are implied, but not stated within the query (for example in a query for flooding in SW England, identifying towns such as Exeter within that region, without it being explicitly articulated in the query).

Geographic queries were incorporated into the EnviLOD tool, enabling users to search using location-based queries that allow them to narrow down results by name, geographic coordinates, population, population density and country code (see below). Users were also allowed to search for locations that a river 'flows through', as well as search for documents mentioning locations which are 'near' a specified location. The former proved to be a very popular feature, whereas the latter proved to be confusing, as the definition of 'near' was not defined explicitly (i.e. as within x miles from the given location).



3.2 Answering non-open-ended queries

In this case, the user is asking for a specific piece of information which might pertain to a budget, specific piece of legislation, flood levels in a particular locality, etc. For example: What is the annual flood defence expenditure in The Netherlands? These are questions that can be definitively answered, and to which semantic search algorithms can likely be easily trained.

In the initial user survey, user queries tended to cluster around topics pertaining to flood management and defence, finance and spending, and policy and regulation. Many of these are enhanced by the location-based query searching enabled by the EnviLOD interface. It also enables users to search on bits of the article metadata (ex- author/publication year/title etc), as well as conduct searches on Organisation name or Industry.

3.3 Answering open-ended queries

In this case, a user is conducting research with an aim of learning more about a particular topic. In this case, there is no definitive 'answer' to the query—the question is answered once the user has established that s/he has sufficient information on the topic. For example: What are some examples of community engagement relating to flood risk management? These questions are likely more difficult for a LOD approach to add value—but nevertheless represent an important type of question asked by survey respondents.

Although the EnviLOD tool can point users towards relevant information, because the answers to these sorts of queries are subjective and depend on the user assessing that they have learned enough about a particular topic, it was agreed that this is not an appropriate application of semantic technology in the context of environmental science.

4. User Evaluation Design

In order to allow users to compare directly keyword-based search results against the EnviLOD semantic search and its results, evaluation participants were asked to complete four search tasks:

Task 1. Find documents on flooding on rivers flowing through Gloucester

Task 2. Find documents on flooding in places near Sheffield

Task 3. Find documents on flood risk management in locations with population less than 15000 inhabitants

Task 4. Find the areas at risk of surface water flooding in London

First they were asked to complete the task using keyword search only, then to formulate the query including also semantic search constraints from the form-based interface of the EnviLOD tool. For each of these, participants were asked to write down the queries they used, as well as any other notes they wished to make on query formulation. See Appendix A for the task definitions and Section 5 for an analysis of task success rates and problems encountered.

Due to content copyright issues, the evaluation was carried out on limited content. We indexed 1000 metadata records (including abstracts) and 50 PDFs, including reports from Defra, the Environment Agency, and the Scottish Government, as well as some NERC metadata from the NORA repository.

More formally, the experiment has a repeated measures, task-based design (also called within subjects design), i.e., the same participants interacted with the two versions of the system, in order to complete a given set of tasks. Prior to the experiment, the participants were given a 15 minute live demonstration of the EnviLOD semantic search interface, in order to familiarise them with the way semantic restrictions are formulated with the list-based form interface. Afterwards, participants were given 30 minutes to complete the tasks, using the two search methods.

After completing all the tasks, the participants were asked to fill in a questionnaire (shown in Appendix B) and participate in a group discussion session (30 minutes) focused on their experience with the two systems.Questionnaire results are presented in Section 6 and the qualitative feedback – in Section 7 below.

5. Task Success Rates

17 task sheets were returned, including query formulations and comments on the 4 search tasks. Here we analyse the feedback and task success on a task by task basis.

	Task 1	Task 2	Task 3	Task 4
Task completion rate	100%	88.24%	88.24%	76.47%
Found answers with keyword search only	47.06%	70.59%	35.71%	69.23%
Sem search results better than keyword search	82.35%	70.59%	96.43%	73.08%

Firstly, task success rates vary by task. This is partly due to the higher complexity of tasks 2, 3, and 4, but also some users simply did not attempt the later tasks, because they ran out of time. Nevertheless, each task was completed by at least 13 participants.

The percentage of participants who found relevant documents using only keyword search varies depending on the tasks. The low results in tasks 1 and 3 are exactly on the tasks, where additional knowledge, not present explicitly in the documents is needed, in order to filter out the relevant results. Namely, in task 1 this is knowledge on which rivers flow through Gloucester and in task 3 – which places in the UK have population less than 15,000 inhabitants. Task 4 is about searching for risk areas in London, where again some relevant documents do not explicitly mention the string London.

Overall, participants did find that the results obtained by using semantic search were better than those from keyword search alone. However, as task success rate indicates, not all users were able to learn how to use the semantic search constraints, even though all necessary interface functionality had been demonstrated in advance.

6. Questionnaire Analysis

The evaluation questionnaire contained 8 questions (see Appendix B). The number was kept low, due to the limited time available, as well as our focus on qualitative feedback, to help us improve the user interface prior to final delivery at project end.

The first seven questions are based on the SUS usability questionnaire[1]. The first question focused on frequency of use. The second, third, and seventh questions examined the complexity of use of the EnviLOD UI. Questions four, five, and six probed how hard it is to learn the EnviLOD UI. The parallel to the SUS questionnaire allowed us to use the same scoring mechanism, thus making the results broadly comparable.

The last question asked whether the search results made sense to the user and is thus EnviLOD specific.

[1] http://hell.meiert.org/core/pdf/sus.pdf

6.1. Overall Questionnaire Scores

In total, we received 16 filled in questionnaires. Appendix C shows the collated results in a table. The 5 point Likert scale was mapped to numerical scores between 1 (Strongly Disagree) and 5 (Strongly Agree).

Following the SUS scoring methodology for such questionnaires, we subtracted one from the numeric scores for answers to our questions 1, 3, 5, and 8. For the other four questions (which were negative) we subtracted the user responses from five. This scales all response values between 0 and 4 (with four being the most positive response). Then all converted responses were added up and scaled.

The mean questionnaire score is 72.3, which indicates that the system has good overall usability (this score is scaled to match the SUS scores, where a good SUS score needs to be over 68). Standard deviation is 10.2. 69% of participants scored the system above 68 overall. The mean and standard deviation remain very similar, even when the newly added question is excluded from the scores (73 with SD of 11).

6.2. Frequency of Use

As can be seen from the results in Appendix B, 9 of the 16 (56.3%) participants agreed or strongly agreed that they would use such a system frequently. Another 6 participants were neutral and only 1 participant strongly disagreed.

One thing which needs to be taken into account here is that the group included not just environmental science researchers, but also technology developers and users from other application domains. Therefore, it is not clear from the questionnaire alone, whether the question was interpreted specifically as frequency of use of semantic search vs frequency of use of the EnviLOD search interface in particular. This distinction is however important, since the latter UI is highly specific to environmental science.

6.3. System Use

Questions 2, 3, and 7 in our questionnaire examine how easy or complex is the EnviLOD UI to use. In particular, 14 of the participants (87.5%) disagreed or strongly disagreed with the statement that the UI is unnecessarily complex and 2 were neutral. On question 3 (ease of use), 13 of the participants (81.25%) agreed or strongly agreed that the EnviLOD UI is easy to use. Question 7 is the opposite of question 3, since it stated that the system is very cumbersome to use. There 12 participants disagreed or strongly disagreed (75%), which validates the positive answers to question 3.

Overall, from the survey we can conclude that there are no major issues with the EnviLOD semantic search UI, which make it complex or hard to use for the majority of users.

In subsequent, largeruser evaluations of semantic search interfaces, we plan to include a survey section asking users to provide some basic detail on their knowledge of the subject domain, semantic search, Linked Open Data, and general use of search tools. This would enable us to draw more in-depth conclusions and examine any differences due to background and domain knowledge.

6.4. Ease of Learning

Questions 4, 5, and 6 were focused around learning the EnviLOD user interface. 15 of the 16 participants (93.75%) disagreed or strongly disagreed that they would need help from a technical person to use the system (question 4). The same participants also felt they can use the system without needing to learn more about it first, i.e. they disagreed or strongly disagreed with question 6. Participants were more divided around the question of how quickly would others learn the EnviLOD semantic search UI (question 5). There only 11 of the 16 (68.75%) agreed or strongly agreed with this statement.

From this we can conclude that users could learn to use the EnviLOD UI successfully and confidently after only a short demonstration. However, open questions remain as to how easy it would be for untrained users to learn the system, without training. We will return to this question in Section 7.

6.5. Result Quality

The last question focused on whether the results returned by the semantic search UI made sense to the users. There 12 of the 16 participants (75%) agreed or strongly agreed with this statement. Again, a more in-depth follow-up user study is needed, in order to understand how much of this is due to mistakes made by the system versus users not being specialists in the domain versus using only limited amount of document content in the experiment.

Overall, coupled with task success rates and comments made as part of task completion (Section 5), we can conclude tentatively that the results produced by semantic search were meaningful and useful to the users.

7. Qualitative Feedback Received

Workshop participants also worked in groups to provide feedback and discuss the EnviLOD semantic search interface. The authors of this deliverable lead three such groups, which were designed to have between 6 and 10 participants each, in order to stimulate discussions and allow sufficient time to gather feedback. In addition, we asked participants to give short written suggestions after the structured usability questionnaire (see Appendix B), focused on three topics:

- Barriers in adopting an EnviLOD style semantic search interface
- Suggestions for interface improvements
- Any new features that they would like to see covered by a semantic search UI

In terms of possible adoption barriers by non-specialist users, workshop participants mentioned:

- Removing the need to see first a demonstration of how semantic search works
- Need to include a large amount of environmental science content, since the current limited number of documents in the experimental system does not allow users to be confident in its coverage
- Differences from Google keyword search, since the EnviLOD keyword search syntax currently requires users to specify conjunction of keywords explicitly
- Helping non-specialist users formulate successfully semantic searches
- Need to understand to a degree the underlying ontological relations which give rise to the semantic search restrictions, e.gnear by, location.

With respect to suggestions for interface improvements and new features, we include a discussion of these in each of the three sub-sections, in order to show which user group initiated which ideas.

7.1 Environmental Science Users

The environmental science user group responded favourably to the EnviLOD interface. They felt the demonstrated use case of improving discovery of location-based information was particularly useful. However, they acknowledged that given the breadth of environmental science as a topic, the EnviLOD tool is probably best used for answering specific types of questions, and that with an expanded scope, its usefulness would likely decrease. The group also expressed concerns about what the tool might be missing - how can users be assured of the comprehensiveness and accuracy of the results.

The users in the environmental science group varied in terms of their technical skills - some already worked with linked data, others were involved in data management, and some were practicing environmental scientists.

There were also suggestions to move EnviLOD towards combined searching over structured data and unstructured content. Amongst other things, this would help research causality and allow for environmental science specific visualisations, e.g. hydrographic concepts.

Interface improvement suggestions received from this group included having a settings tab to show more details of the relationship between ontological concepts and relations on one hand and interface elements on the other. These users were also interested in having an advanced option where they could see the semantic annotations added to the document content, e.g. through highlighting. Another suggestion was to allow advanced users to edit the formal semantic search query, e.g. to add or remove elements, change spelling. Another idea was to show more feedback on why a certain document was matched, especially when this is a result of using implicit semantic knowledge from the LOD resource (e.g. if a population restriction is used or distance-based restriction), as this is not always obvious to the user, who decides then the results are not relevant.

7.2. End-Users from Other Domains

This group comprised 6 participants, mostly current and potential end-users of semantic search, working in domains and applications other than environmental science. This included but was not limited to publishing, disaster response, and research management.

Participants in this group liked the simplicity of the interface and the help the lists provided with formulating the semantic queries. They did raise some questions about how accessible would the system be for users, who have not seen a demonstration first, especially for non-specialist ones, who might not even be familiar with Google advanced search and/or other more complex search interfaces and query languages.

They also suggested some usability improvements, following their experiments with the EnviLOD UI:

- Allow users to control the number of hits shown per page, e.g. 20, 50, etc.
- Auto-clear the search fields, after a query, although others said they refine queries over time, so such an autoclear would get in the way of iterative query refinement

- More intuitive highlighting of the semantic hits within the matching documents
- Keyword search needs to behave more like Google search, i.e. if several words are typed, then the search query must be interpreted as "return all documents which contain these words regardless of the distance between them". Phrase-based queries and/or required distance between search terms (e.g. within at most 10 words, within the same sentence) need to be supported through additional, more advanced syntax.
- Help icons or tooltips must be present for each interface item, to help users self-study
- The Submit and Clear button need to be made easier to distinguish, through colour (green vs red) and through icons.
- Use Arial font, since it is more readable
- Clear the results from the previous query, i.e. the list of shown documents, before issuing the new query, since long-running queries confuse users into thinking that they have finished and these are the matching results

More substantial and challenging suggestions included:

- Support for user feedback on the relevance of each returned result, to help train the text mining and information retrieval engines underneath
- Support queries in natural language, instead of relying on a structured interface, perhaps support a semi-formal query language
- Map-based visualisations to support result visualisation and browsing users
- Indicator of system confidence in the results
- Ability to disambiguate better names in semantic queries, e.g. Location with name containing Norton – there are 9 such towns, so would be good for the UI to allow users to choose which one they mean

7.3. Text mining and Semantic Technology Providers

This group contained participants who had a computer science background and were familiar with semantic technologies and, to a lesser degree, text mining. They develop solutions based on this technology and were thus interested to experiment with EnviLOD and hear first hand about impressions from end users in environmental science and other domains.

Part of the discussion centred on the choice of relevant Linked Open data for inclusion into the semantic search UI and as an underlying knowledge source for the semantic enrichment algorithms.

Participants in this group did not experience any difficulties with understanding how the EnviLOD UI works and spent some of the time experimenting with searches beyond the four evaluation tasks. In addition, the participants gave feedback on the EnviLOD UI, in many cases suggesting similar usability improvements to those listed in Section 7.2. Some new ones included:

- Ability to draw a region on a map and then use this information as filter for location-based searches.
- Nearby queries for locations need to be replaced with “Location X with N miles/km of location Y” where N is a number given by the user, with a default value, e.g. 30 miles.
- Support for negation in queries
- “More like this” functionality, to help users to refine semantic searches

8. Conclusions

This deliverable described the user feedback received during two evaluation sessions, carried out towards the end of the 7 month long EnviLOD project. The first smaller user evaluation session was held internally at HR Wallingford and was used as an initial test of our semantic search user interface. Following this, some minor adjustments were made to the UI and it was presented at a much larger user workshop, held at the British Library five days before the end of the project. The core of this deliverable focused on the outcomes of the second, much larger user evaluation.

Overall, workshop participants found the EnviLOD semantic search UI easy to learn and use. Importantly, this included environmental scientists, who particularly appreciated the use case of location-based search. The group discussions and the three written feedback questions on the survey forms allowed us to elicit a number of small, easy to implement changes to the user interface, which we hope to improved usability in the future. We are planning to implement these in follow-up research and then carry out a second user-based evaluation, this time with users recruited online, who will not be shown a demonstration of the semantic search in advance.

In addition, we also elicited a number of more challenging ideas for future improvements, which cannot be easily addressed within the scope of short, informal follow-up work. The most substantial of these include the implementation of a natural language interface, map-based visualisations, support for user feedback on search results and search query refinement by example. These are all valuable possible extensions to this work, including building a natural language interface (see (Damljanovic et al, 2013) for some preliminary work which we have done on this already). However, to fully address these, a much longer and larger, two or three year project would be required.

Lastly, a known limitation of this evaluation which could have impacted on our results came from the limited amount of content, which we could index in the experimental system. This was due to copyright issues with the majority of environmental science content at the British Library. Due to this limited content, participants were not always able to judge how comprehensive or accurate semantic search is, especially if compared against results offered by Google. Since the British Library are now planning to integrate the EnviLOD semantic enrichment tools within the advanced Envia Labs functionality, future work on this projectcould potentially be able to evaluate on more comprehensive data through the Envia system.

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Appendix A: EnviLOD Search Tasks and Feedback Form

EnviLOD Search Interface Evaluation Tasks

Dear User,

Having demonstrated the EnviLOD search interface to you, we request you to give it a try and share your experience with us. To make it easier for you, we have provided a few questions below. We request you to please try to find relevant documents for these questions and using the EnviLOD interface[1] and provide details for your search.

When using the EnviLOD interface, general idea is to think about keywords that one might use to query Google (or similar search engine) but also utilise the semantic constraints (where appropriate) offered by the EnviLOD interface.

Questions

1. Flooding on rivers flowing through Gloucester

Were you able to find answers using keywords only? yes/no
Did you find better results after using the semantic constrains? yes/no
Keywords and semantic constraints used:

2. Flooding near Sheffield

Were you able to find answers using keywords only? yes/no
Did you find better results after using the semantic constrains? yes/no
Keywords and semantic constraints used:

3. Flood risk management in places with populations < 15000?

Were you able to find answers using keywords only? yes/no
Did you find better results after using the semantic constrains? yes/no
Keywords and semantic constraints used:

4. **Risk areas in London for surface water flooding**

Were you able to find answers using keywords only? yes/no
Did you find better results after using the semantic constrains? yes/no
Keywords and semantic constraints used:

1You may want to quickly skim through the HELP section of the EnviLOD search interface, which explains the purpose of various options provided in the interface.

Appendix B: EnviLOD SUS-Based Questionnaire and User Feedback Form

User feedback for the EnviLOD search interface

	Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
I think that I would like to use this system frequently					
I found the system unnecessarily complex					
I thought the system was easy to use					
I think that I would need the support of a technical person to be able to use this system					
I would imagine that most people would learn to use this system very quickly					
I needed to learn a lot of things before I could get going with this system					
I found the system very cumbersome to use					
The search results produced by the system make sense to me					

What would be your greatest barriers in using a search tool, such as this?

Do you have any suggestions for improving the interface?

What other features would you like to see?

Appendix C. Questionnaire Participant Scores

Question ID	1	2	3	4	5	6	7	8
Participant 1	3	2	4	2	4	2	2	4
Participant 2	3	2	3	2	3	4	3	3
Participant 3	4	2	4	1	5	2	2	3
Participant 4	3	2	5	1	3	1	1	4
Participant 5	5	1	5	1	4	1	1	5
Participant 6	3	2	4	2	4	2	2	4
Participant 7	4	2	5	1	5	2	2	4
Participant 8	4	2	4	4	3	2	2	4
Participant 9	5	2	4	1	4	1	1	1
Participant 10	3	2	4	2	4	2	3	4
Participant 11	4	2	4	2	4	2	2	4
Participant 12	5	3	3	2	2	2	3	4
Participant 13	3	2	4	1	4	2	2	4
Participant 14	4	2	4	2	4	2	2	4
Participant 15	1	2	4	2	4	2	2	3
Participant 16	4	3	3	1	2	2	3	4

Strongly Disagree = 1; Disagree = 2; Neutral = 3; Agree = 4; Strongly Agree = 5