

EcoLexicon

Introduction

ECOLEXICON is a multilingual terminological knowledge base (TKB) on the environment. The knowledge base was initially implemented in Spanish, English and German. Currently, three more languages are being added: Modern Greek, Russian and Dutch. So far it has 3,547 concepts and 18,875 terms. It targets different user groups, such as translators, technical writers, environmental experts, etc., who wish to expand their knowledge of the environment for the purpose of text comprehension or generation. These users can freely access EcoLexicon and are able to find the information needed, thanks to a user-friendly visual interface with different modules for conceptual, linguistic, and graphical data. The main and ultimate goal of EcoLexicon is user knowledge acquisition, which can only be achieved if TKBs account for the natural dynamism of knowledge mainly caused by context and multidimensionality.

Novelties

The new version of EcoLexicon includes the following new features, which are an improvement over the previous version:

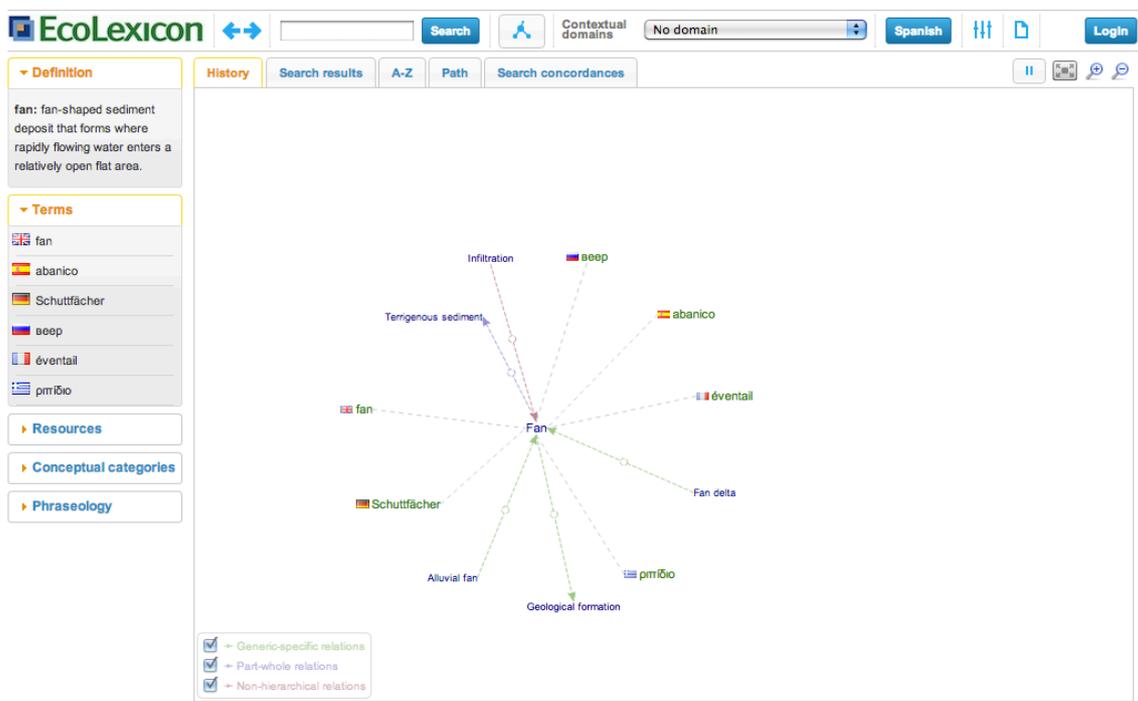
- It is compatible with all modern browsers and does not require Java.
- It has more interactive and configurable maps, which allow the users to do the following:
 - Change the scale of the map.
 - Select the relations to be represented.
 - Eliminate nodes in order to make other nodes more prominent.
 - Adjust the position of nodes.
 - Go backwards or forwards.
 - Establish a direct link to a concept or term.
 - Look up a concept or term on Google or Google Images.
- It has new representation modes:
 - Hierarchical tree structure
 - Map of the shortest path between concepts
- It allows user registration to do the following:
 - Personalize results.
 - Store user preferences between sessions.

User manual

First impressions

When users open EcoLexicon, three zones appear:

1. **Top bar** that allows access to different functionalities, such as the term/concept search or changing the language of the interface.
2. **Side bar** that shows information about the central item on the menu: definition, terms/concepts, related terms/concepts, associated resources, conceptual categories, and phraseology.
3. **Central area** that includes a series of tabs that allow the user to access: (i) the history of concepts/terms visited; (ii) the results of the most recent search; (iii) the shortest path between two concepts; (iv) concordances for a term. Also included are the map of the concept with its terminological designations as well as the icons that allow the users to configure the map.

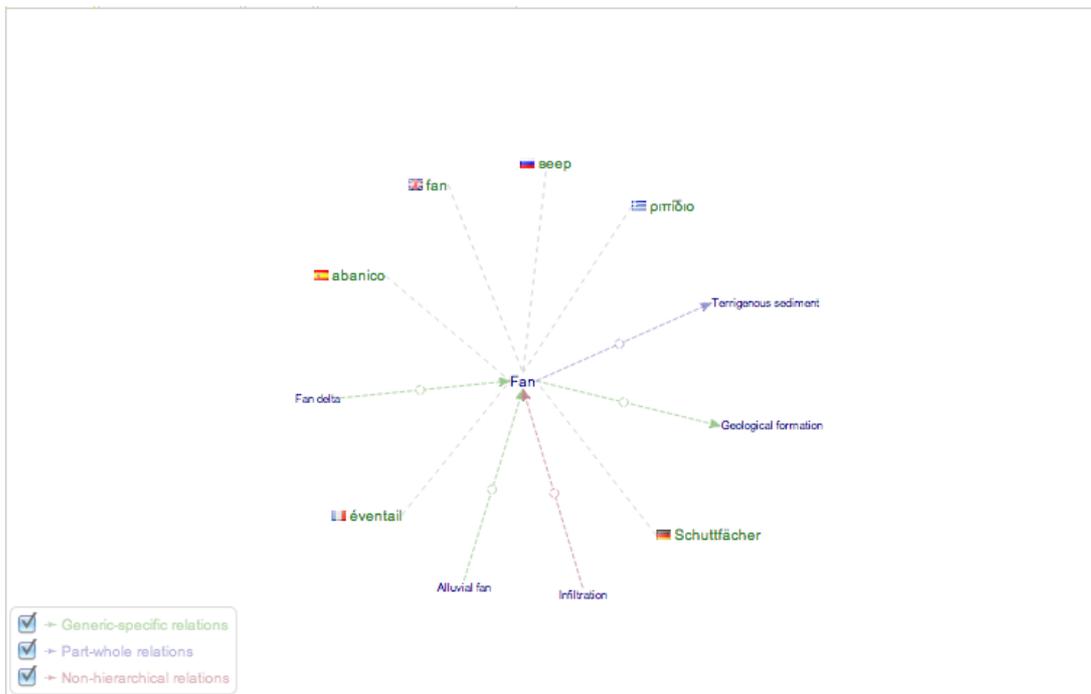


Screenshot 1. Main screen of EcoLexicon showing the three main zones: top bar, side bar and central area.

Interaction with the map is easy and intuitive. The normal representation mode shows a conceptual map with a series of related items (concepts and/or terms). The items included in the map are determined on the basis of a central concept/term. In other words, the map shows all of the concepts and terms associated with the search item, and in turn, the concepts and terms linked to with the associated ones as well. The position of the entities is determined by an algorithm for their automatic arrangement in order to maximize legibility and minimize the size of the map.

The first time that users access EcoLexicon, a conceptual map appears in which the concept fan is central with its terminological designations. When users click on any of

the terms or concepts in the map, the network rearranges itself. In this new map, the term/concept that was clicked on is at the center and is connected with all of the entities directly related to it.



Screenshot 2. Conceptual map centered on the term 'fan'.

In the lower left corner of the map, there is a text box with captions that allow users to identify the three categories of conceptual relations in EcoLexicon: (i) hyponymic (generic-specific) relations; (ii) meronymic (part-whole) relations; (iii) non-hierarchical relations. Moreover, thanks to the checkboxes at the left of each label, users can activate or deactivate the visualization of that type of relation on the map.



Screenshot 3. Map captions.

The map also includes a series of buttons that allow users access to new functions. With the buttons *Zoom map* and *Zoom out map*, it is possible make the conceptual map increase or decrease in size. Users can click on the icon *Fullscreen* to occupy all of the available space in the browser, which allows a better visualization of the map. Finally, the icon *Stop automatic layout* deactivates the automatic arrangement of concepts in the network, thus allowing users to configure the entities themselves by dragging them with the mouse to the desired location.

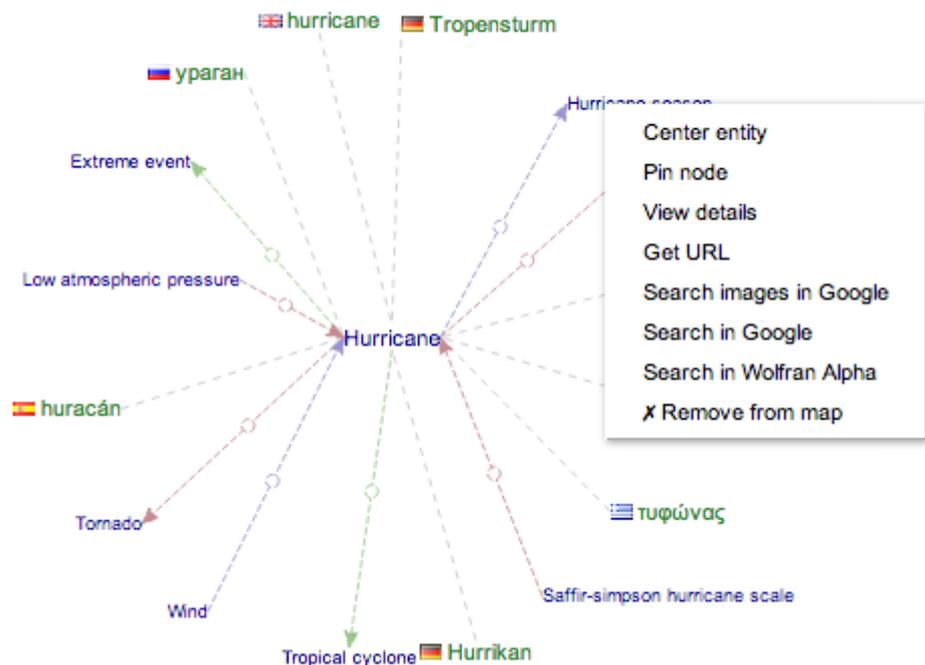


Screenshot 4. From the left to the right: 'Stop automatic layout', 'Full screen', 'Zoom in' y 'Zoom out' buttons.

Contextual menu

Making a right click on the concept in the map, the user can access the contextual menu. The options on this menu are the following:

- Center the concept.
- Fix the node at a certain point by dragging it there without affecting the automatic configuration of nodes.
- Show details of the concept/term (definition, associated terms, resources, etc.) by selecting it on the sidebar.
- Obtain a URL that directly points to the concept/term selected. If the user copies and pastes this URL in the browser, EcoLexicon will be accessed and the concept/term will be at the center of the new conceptual map.
- Search Google Images, Google, and Wolfran Alpha. By selecting any of these options, the user will be able to use one of the search engines to access information about the concept.
- Remove a concept from the map as well as all other related concepts.



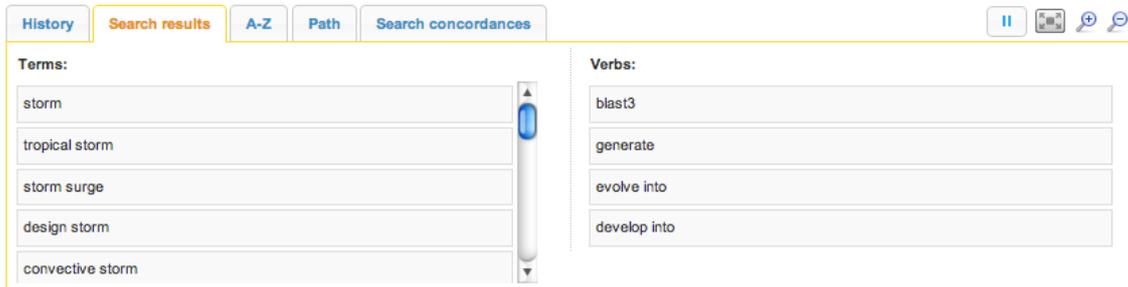
Screenshot 5. Contextual menu.

Searching EcoLexicon

EcoLexicon offers the possibility of searching for terms in the knowledge base. To look up a term, users can enter the term in the search box on the menu bar at the top of the screen. The search begins when users either press *Intro* or click on the *Search* icon. The results appear in the *Search results* tab and the most relevant result will become the center concept in a new map. The *Results* tab also shows all the concepts/terms coinciding with the search term. Users can make any of these items the center of the map by clicking on it.



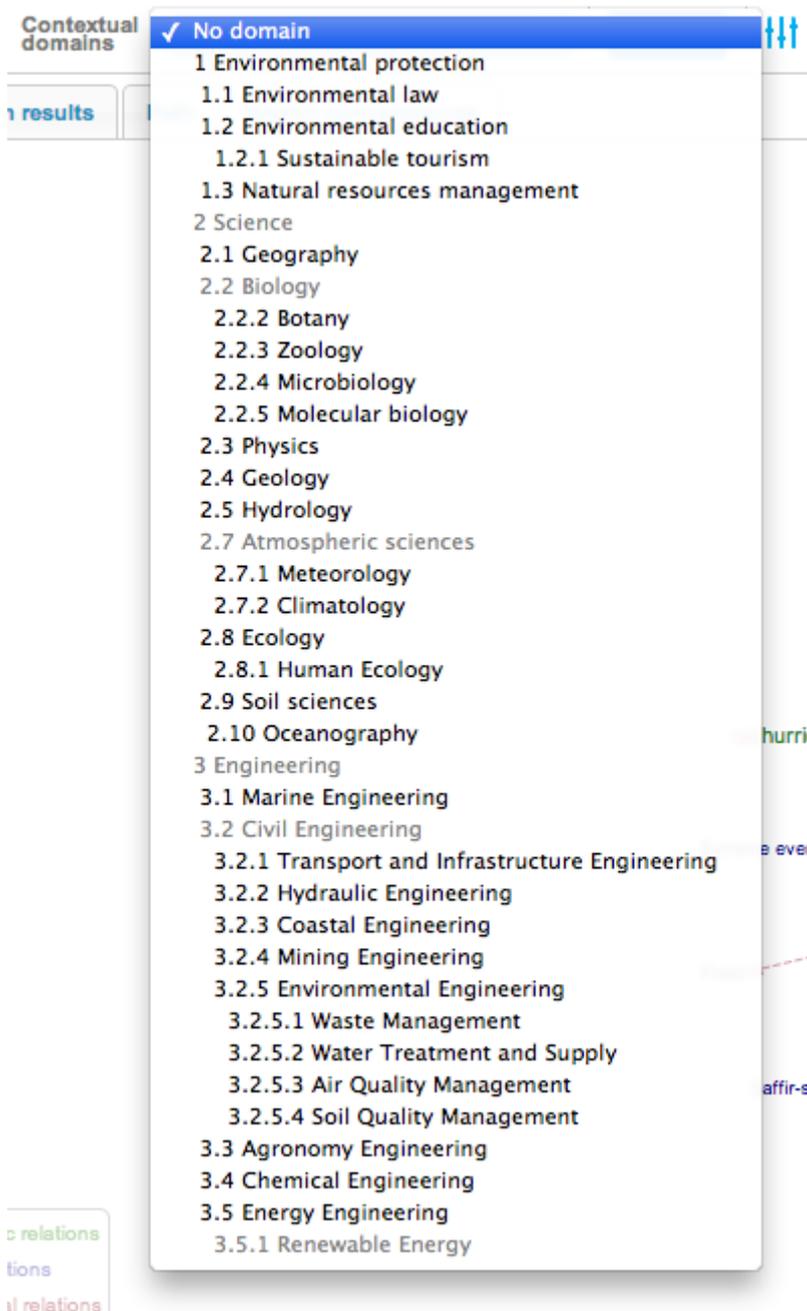
Screenshot 6. Search field and button.



Screenshot 7. Search results tab. It shows the search results (terms and related verbs) for the term 'storm'.

Contextual domains

One way to personalize the conceptual map is by means of the contextual domains generally associated with a specialized knowledge field (e.g. Geology, Coastal Engineering, Environmental Law, etc.). The choice of domain restricts the relations in the map only to those that are relevant for that contextual domain. This allows users to focus on the knowledge area or specific domain and to eliminate irrelevant information. To select a contextual domain, users only have to select it from a drop-down list labeled *Contextual Domains*.



Screenshot 8. List of available contextual domains.

Browsing

EcoLexicon saves the list of search concepts/terms, which allows users to go backwards and forwards on this list, in the same way as on web browsers. To do this, the user can press the icons *Go back* and *Go forward* included in the top bar. Furthermore, the user can access this list on the tab *History* to select any of these concepts.



Screenshot 9. Browsing buttons.

Accessing information about concepts and terms

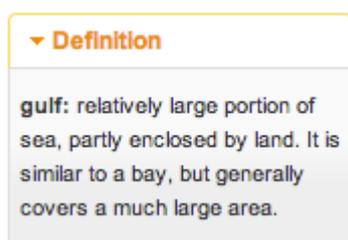
The EcoLexicon sidebar contains a series of boxes that shows information concerning the selected concept or its terminological designations.

Definition

This box provides the definition of the concept, which is at the center of the conceptual map.

Terms

This box shows a list of all the terms designating the central concept. The list is ordered by language and term type (main entry term, synonym, variant, acronym, etc.). At the left of each term, there is a small flag representing the country where its language is spoken. To know more about the term (gender, grammatical category, phraseology, etc.), users can left click on the term and a window will appear with this information.



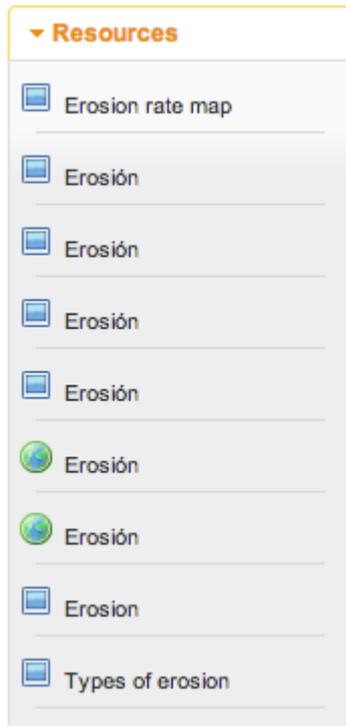
Screenshot 11. Definition box for the concept 'gulf'.



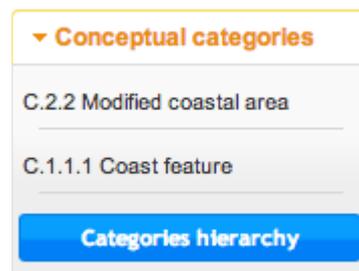
Screenshot 10. Term box for the concept 'gulf'.

Resources

Ecolexicon also provides resources (images, documents URLs, audiovisual material, etc.) associated with each concept/term. The list of these resources for each concept is shown in this box. Users can easily identify the type of resource by means of the icons beside each of the resource listed. To access more information regarding the resource (title, description, source, etc.) users can place the cursor on the resource and a window will open with this information.



Screenshot 14. Resource box for the concept 'erosion'



Screenshot 13. Conceptual category box for the concept 'gulf'.



Screenshot 12. Phraseology box for the concept 'Hurricane'

Conceptual categories

Each concept in EcoLexicon is associated with one or more conceptual categories, which are shown as a list. If users click on one of these categories, this opens a window with a list of all the concepts. Furthermore, this box includes a *Category hierarchy* icon, which, when clicked on, shows the concepts in a hierarchical format in which nodes can expand or retract. If one of the categories in the hierarchy is clicked on, a window appears with all the concepts associated with that category.

Phraseology

If the central element in the map is a term, this box shows a list of verbs most commonly used with the term.

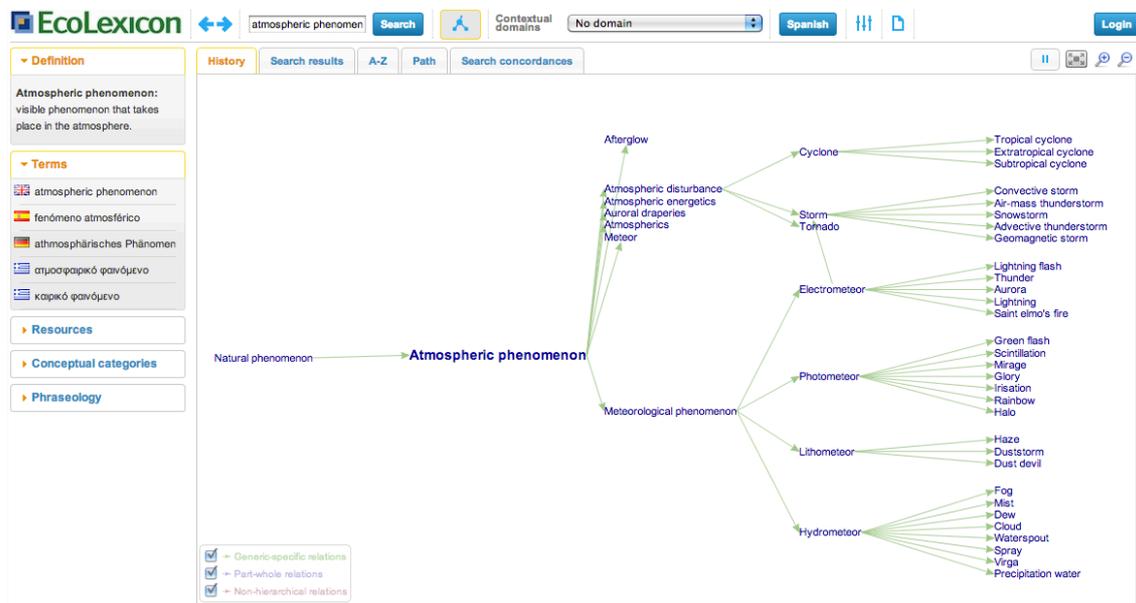
Representation modes

This new version of EcoLexicon includes two new representation modes: tree mode and path mode.

Tree mode

In this mode, instead of the conceptual map, there are two trees, one on the left and the other on the right. Both share the same root, namely, the central concept (not a term). In the same way as a typical ISA hierarchy, the tree on the left shows the more generic concepts and the tree to the right shows the more specific ones in relation to the search concept.

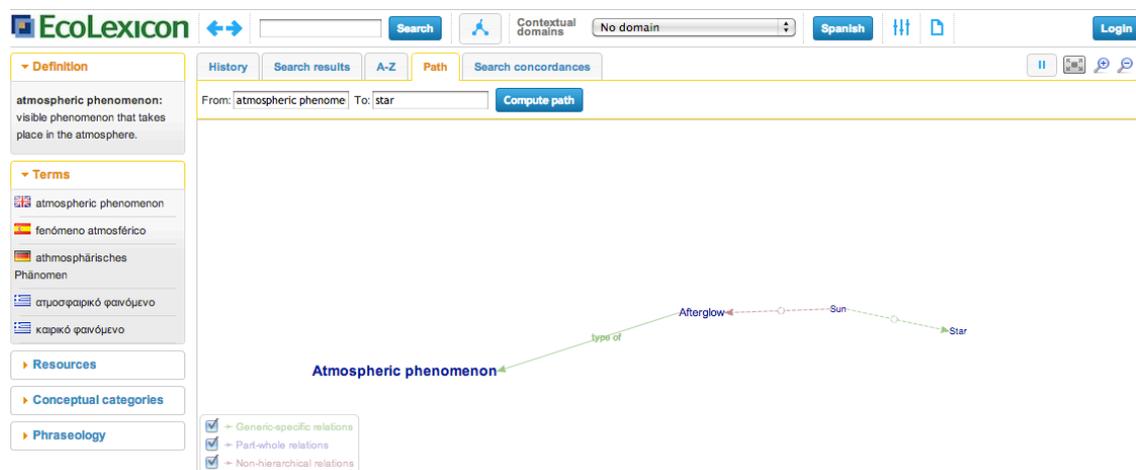
To activate this mode, users should click on the *tree mode* icon () to generate two tree structures that have the search concept as the root. As these trees are being created, a window opens to indicate that the generation process is in progress. The window also includes a *Cancel* icon that allows users to stop the process at any time.



Screenshot 15. Tree mode: parent and children tree of the concept 'Atmospheric phenomenon' as the root.

Path mode

This mode generates a map showing the shortest route between two concepts. To activate it, users should click on the *Path* tab; enter the names of concepts/terms that will be the beginning and end point of the path; and then click on the *Compute path* icon. As the route is being calculated, a window opens up to indicate that the generation process is in progress. This process can be canceled at any time by clicking on the *Cancel* icon. When the process has finished, the shortest path between the concepts will appear in the map.



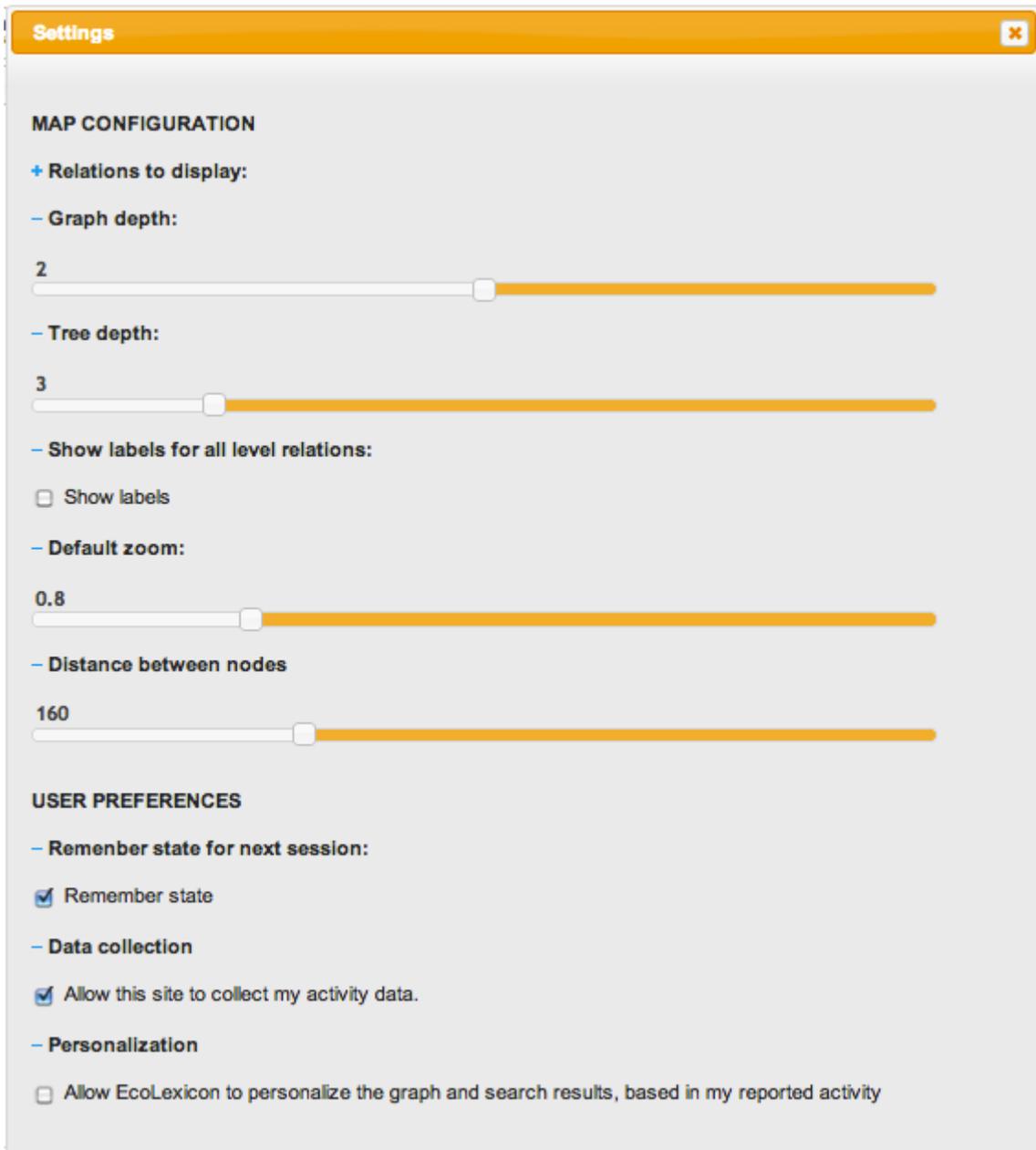
Screenshot 16. Path between concepts 'Atmospheric phenomenon' and 'Star'.

Settings

The menu at the top gives users access to a customization dialog when they click on the *Settings* icon (⚙️). Available settings are divided into two categories: (i) map configuration; (ii) user preferences.

Map configuration

- *Relations to display*. Users can choose which relations of the 17 different types to include in the map. This is accomplished by activating or deactivating the corresponding checkboxes.
- *Graph depth*. Users can select the maximum conceptual depth of the map (i.e. the maximum distance between a concept/term and the central item in the map). The default value is 2.
- *Tree depth*. Users can select the maximum conceptual level of the tree (i.e. the maximum distance between a concept/term and the central item in the map). The default value is 3.
- *Show labels for all relation levels*. By defect, the relation labels only appear when the relation includes the central concept. If this value is activated, all relations will have labels.
- *Default zoom*. Users can select the default value of the scale and/or extension of the map, which is best adapted to their needs.
- *Distance between nodes*. The user can choose the distance between nodes in the map. The default value is 200.



Screenshot 17. Settings dialogue.

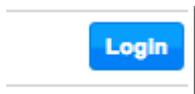
User preferences

- ***Remember preferences for next session.*** EcoLexicon automatically remembers the user's last session and when the application is opened again, the last concept/term visited appears on the screen.
- ***Data collection and storage.*** EcoLexicon automatically collects and stores data regarding user activity and interaction with the system (i.e. concepts/terms selected) with a view to improving and personalizing the results and information provided to users. This option is activated by default and users can deactivate it when they wish.
- ***Personalized results.*** With the information obtained from data collection and by applying artificial intelligence techniques, it is possible to personalize

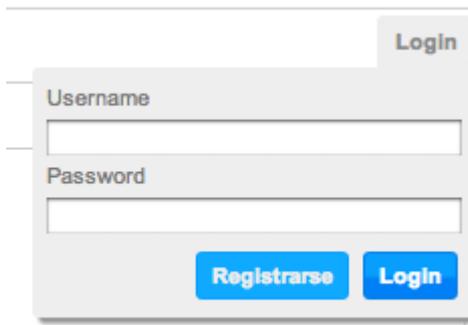
search results, thus increasing their relevance for the user and reducing noise from the retrieval of an excessive quantity of information.

EcoLexicon users

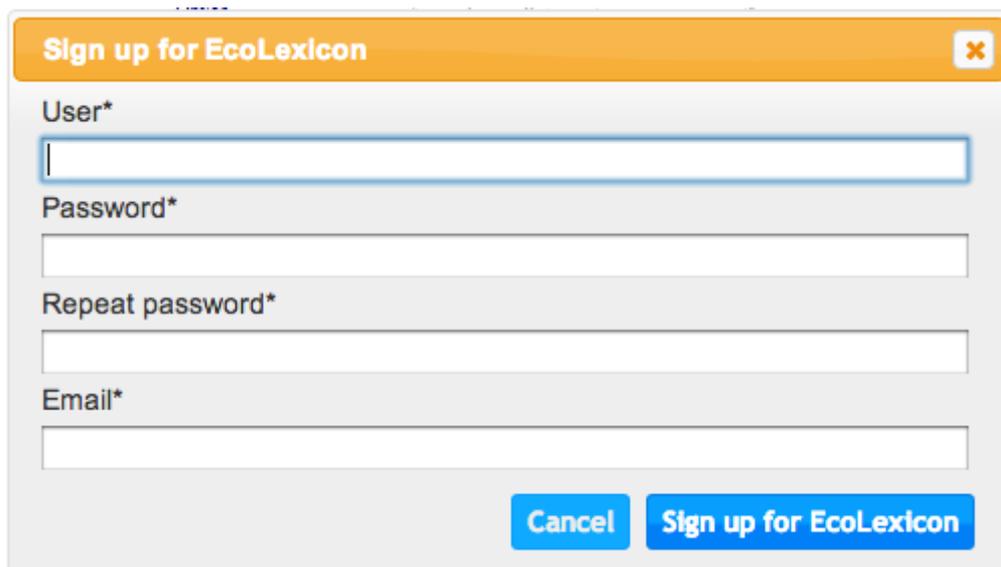
The new version of EcoLexicon allows users to create an account. This permits the storage of their preferences and options, independently of the computer used to access the database. Users can register by clicking on the *Login* icon. They should then click on the *Sign up* icon on the menu that subsequently pops up. This accesses a window with the registration data (user name, password, and e-mail), which must be filled out by users. The process is finished when users click on the icon *Register in EcoLexicon*. If all data are correct, users are then registered. If data are missing or have been incorrectly entered, an error message will appear on the screen, informing users of the source of the problem.



Screenshot 18. Login button.



Screenshot 19. Login dialog.



Screenshot 20. Sign up dialogue.

Once users are registered, they can begin a session by clicking on the *Login* icon, entering their user name and password, and then clicking on *Begin session*. If the user

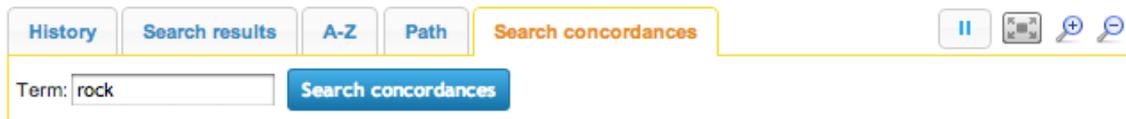
name and/or password are incorrect, an error message will appear. When users enter EcoLexicon, a welcome message will appear in the right-hand corner of the screen, a link to begin the session, and also two icons showing the activation state of user data collection and the personalization of results



Screenshot 21. Welcome message and state icons.

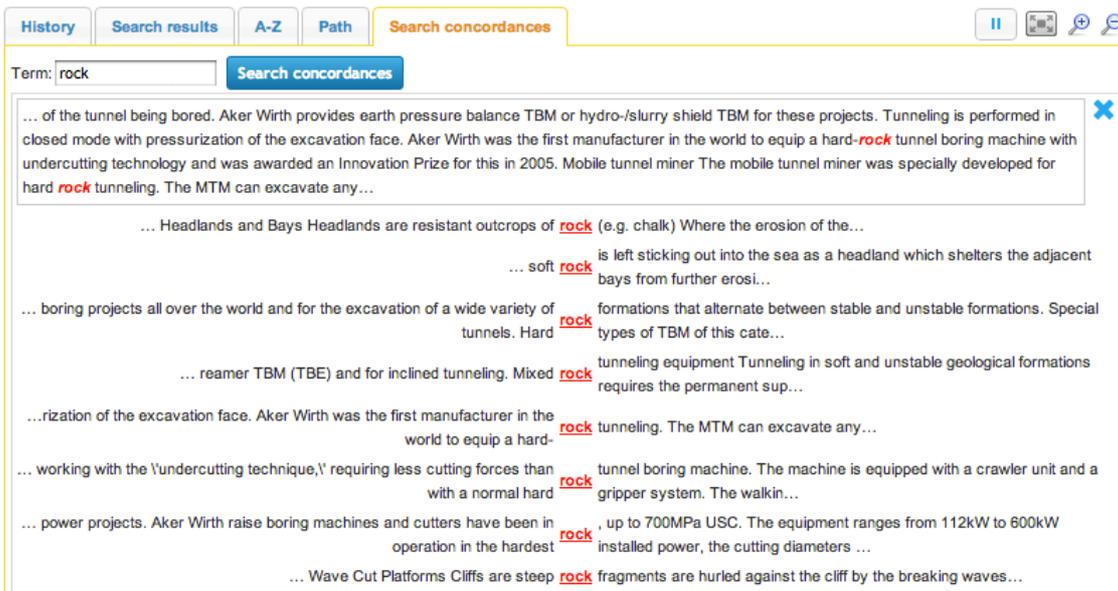
Concordances

EcoLexicon allows term searches within the EcoLexicon corpus. This type of search provides users with a better understanding of the use and collocation of each term. This functionality is currently in the development phase.

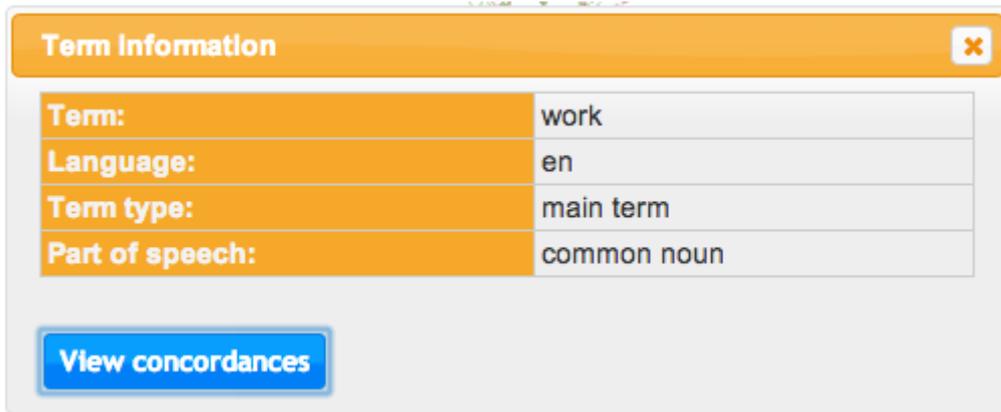


Screenshot 22. Concordance search form.

The list of term concordances is available through the button 'View concordances' in the term information dialog.



Captura 23. Concordance search results for the term 'rock'.

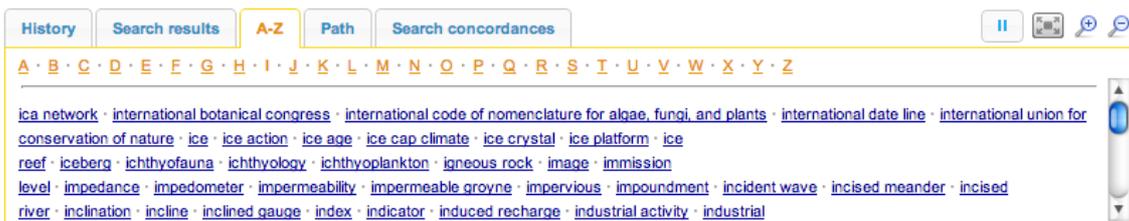


Screenshot 24. Term information dialogue showing the 'View concordances' button.

Other functionalities

Alphabetical listing of concepts

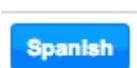
EcoLexicon provides an alphabetical listing of concepts with the 'A-Z' tab. To view a list of all the terms starting with a given letter (e.g., the letter 'G'), the user can click on the letter and all the concepts beginning with that letter will appear (see screenshot 25).



Screenshot 25. A-Z tab showing all the concepts that start with the letter 'G'.

Language preference

EcoLexicon permits users to rapidly change the interface language without losing the current state of the application. This is accomplished by clicking on the icon labeled *English* (if the screen information is in Spanish) or *Spanish* (if the screen information is in English).



Screenshot 26. Language switching button.

Print

EcoLexicon offers users direct access to the printing functionality provided by the browser.



Screenshot 27. Quick print button.