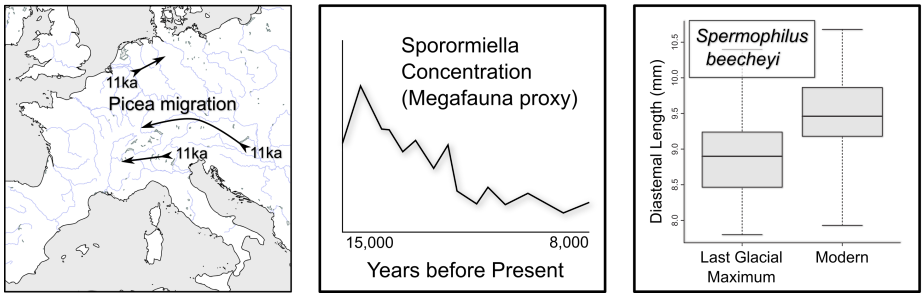


Figure 1: Examples of Quaternary datasets, simplified and adapted from their original publications: (1) Species migration through time beginning 11,000 years before present (11ka), here, *Picea* (spruce) in Europe after the end of the last ice age [from Latalowa and van der Knaap, -@latalowa2006late]; (2) Megafaunal extinction interpreted from the decline in the fungal spore Sporormiella, present in the dung of large herbivores [after @gill2009pleistocene] and (3) change in mammal body size in the ground squirrel *Spermophilus beecheyi* [after @blois2008environmental].

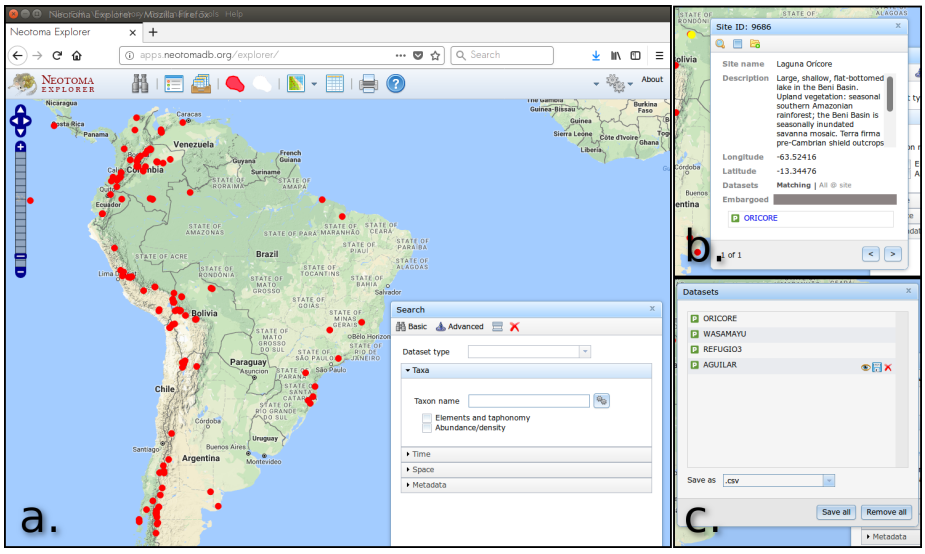


Figure 2: *The Neotoma Explorer is a web based data discovery tool, that allows a map based search for paleoecological sites using species names, site locations, site names, or other associated metadata (a). The tool provides the opportunity to examine individual sites (b) and to select a number of sites for download and later processing or study (c).*

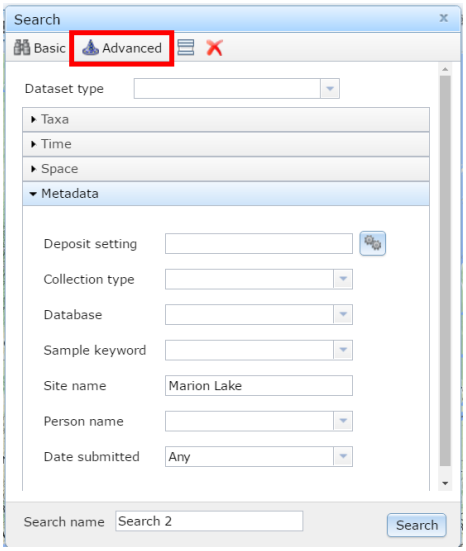


Figure 3: *Searching for Marion Lake using the Neotoma Explorer's search tools (https://apps.neotomadb.org/explorer/).*

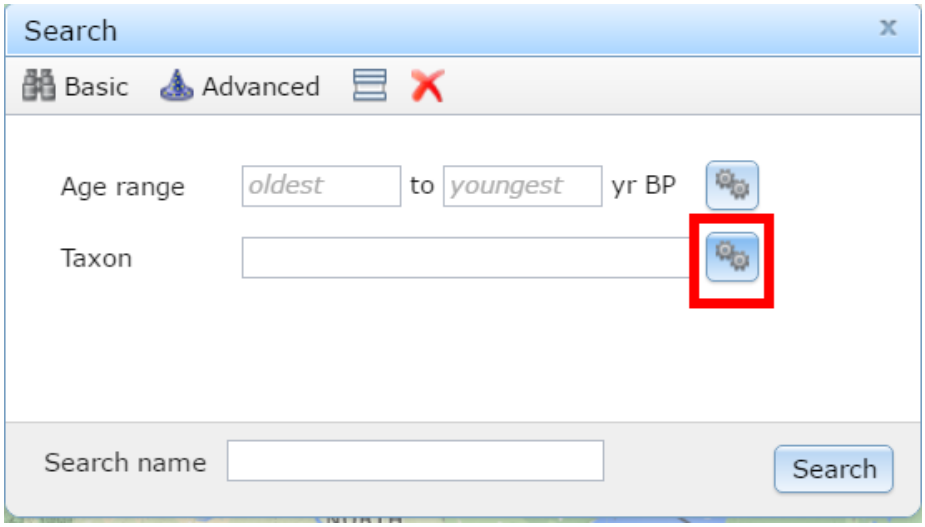
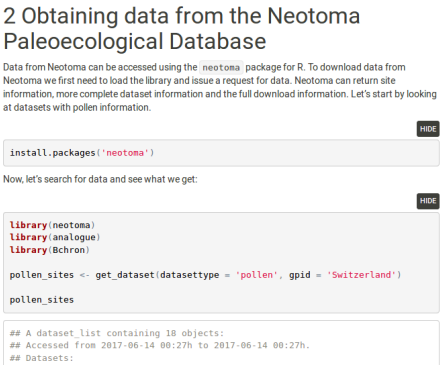


Figure 4: The search tools provide the opportunity to search for a single taxon or for multiple taxa simultaneously.



2 Obtaining data from the Neotoma Paleoecological Database

Data from Neotoma can be accessed using the `neotoma` package for R. To download data from Neotoma we first need to load the library and issue a request for data. Neotoma can return site information, more complete dataset information and the full download information. Let's start by looking at datasets with pollen information.

HIDE

```
install.packages('neotoma')
```

Now, let's search for data and see what we get:

HIDE

```
library(neotoma)
library(analogue)
library(Bchron)

pollen_sites <- get_dataset(datasettype = 'pollen', gpid = 'Switzerland')

pollen_sites
```

```
## A dataset_list containing 18 objects:
## Accessed from 2017-06-14 00:27h to 2017-06-14 00:27h.
## Datasets:
```

Figure 5: Educational material presented on Neotoma's GitHub Pages show the initial stages of constructing chronologies for paleoecological records.

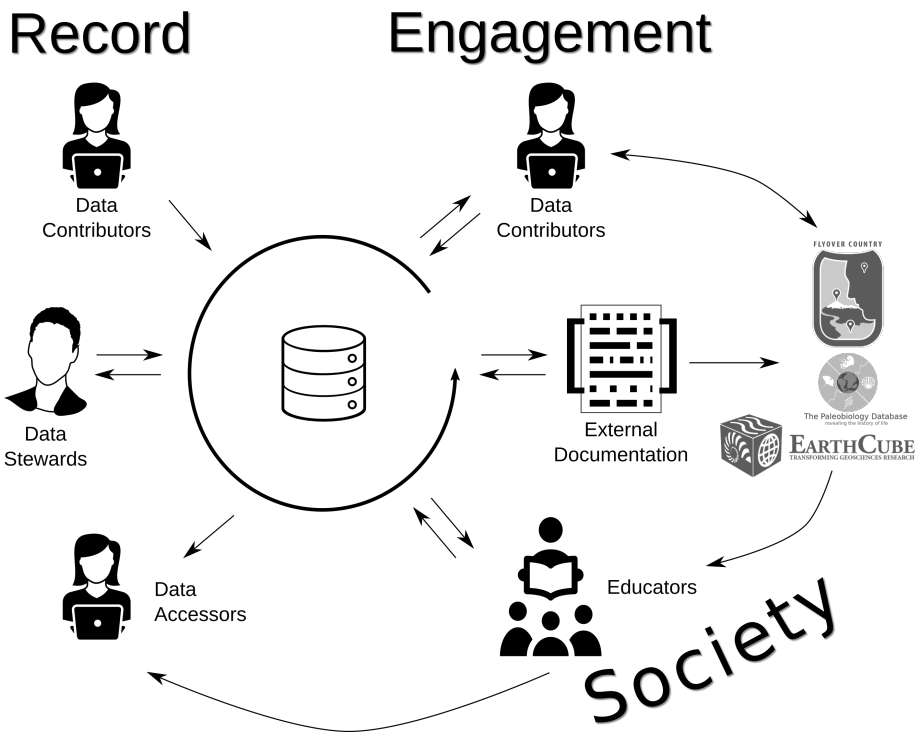


Figure 6: CCDRs involved in engagement can access new communities outside of the traditional sphere of activity in the research community, here various activities allow a database to engage with community experts (data stewards), data contributors, researchers accessing data, but also educators and individuals involved in outreach activities through platforms such as Flyover Country by providing well documented workflows for accessing and understanding the data within the database. Clipart of the woman at a computer, created by Nikita Kozin and clip art of the database by Vicons Design, both from the Noun Project (http://nounproject.com), licensed under a CC-0 license.