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Loup Bernard

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# **Ten Years of ArkeoGIS: Feedback on the Challenges and Benefits of Digitally Sharing Archeological Data**

**Loup BERNARD**

Université de Strasbourg / CNRS-UMR 7044, France

\*Corresponding author: loup.bernard@unistra.fr

## **Abstract**

After more than a decade online, the ArkeoGIS project illustrates the benefits of data sharing. Thanks to free software bricks, and with the precious help of the CNRS's Huma-Num infrastructure, this spreadsheet sharing platform has shown its efficiency. Users can freely select their language, chronology and the data they wish to share. With over 100 database extracts from professionals, research grants and advanced students, the tool now offers more than 100,000 spatialized data units about the past - in the Upper Rhine valley and also worldwide depending on users' needs. In this contribution, good practices, hindrances and accelerators of data sharing among archaeologists and (paleo-) environmentalists on the ArkeoGIS platform will be discussed, with the hope of generating more sharing in the digital humanities.

## **keywords**

Archaeology, (Paleo)environment, GIS, platform, linked open data

## **INTRODUCTION**

After more than a decade online, the ArkeoGIS project illustrates the benefits of data sharing. Thanks to free software bricks, and with the precious help of the CNRS's Huma-Num infrastructure, this spreadsheet sharing platform has shown its efficiency. In this contribution, good practices, brakes hindrances and accelerators of data sharing among archaeologists and (paleo-) environmentalists on the ArkeoGIS platform will be discussed, with the hope of generating more sharing in the digital humanities.

## **I SHORT PRESENTATION OF THE ArkeoGIS PLATFORM**

### **1.1 Purposes**

Thanks to its mapping interface, the ArkeoGIS online platform allows to pool and query spatialized scientific data about the past (archaeology, environment...) in four languages (German, English, Spanish and French).

ArkeoGIS is a multidisciplinary application. The databases come from different sources: institutional research (either personal or contractual), graduate students, private companies and archaeological heritage management services. Palaeoenvironmentalists, geographers and historians also contribute work. Multidisciplinarity is encouraged. All these shared databases can be queried online by ArkeoGIS users. Each user has his own personal and customizable project interface. One can query online all or only a part of these databases, display the results on multiple background maps, save and export them towards other tools (using CSV export).

The chronological frame of the tool is now both customizable and multiple. ArkeoGIS's multi-chronology system allows users to aggregate information from the Prehistory to the Present for different areas. Twelve chronologies are already available, from the Iberian Peninsula and the Mediterranean to the Middle East and continental Europe. ArkeoGIS's geographical frame

allows it to display information about all of these regions. As of today, the most documented areas are the Upper Rhine Valley, the Mediterranean and the Middle East.

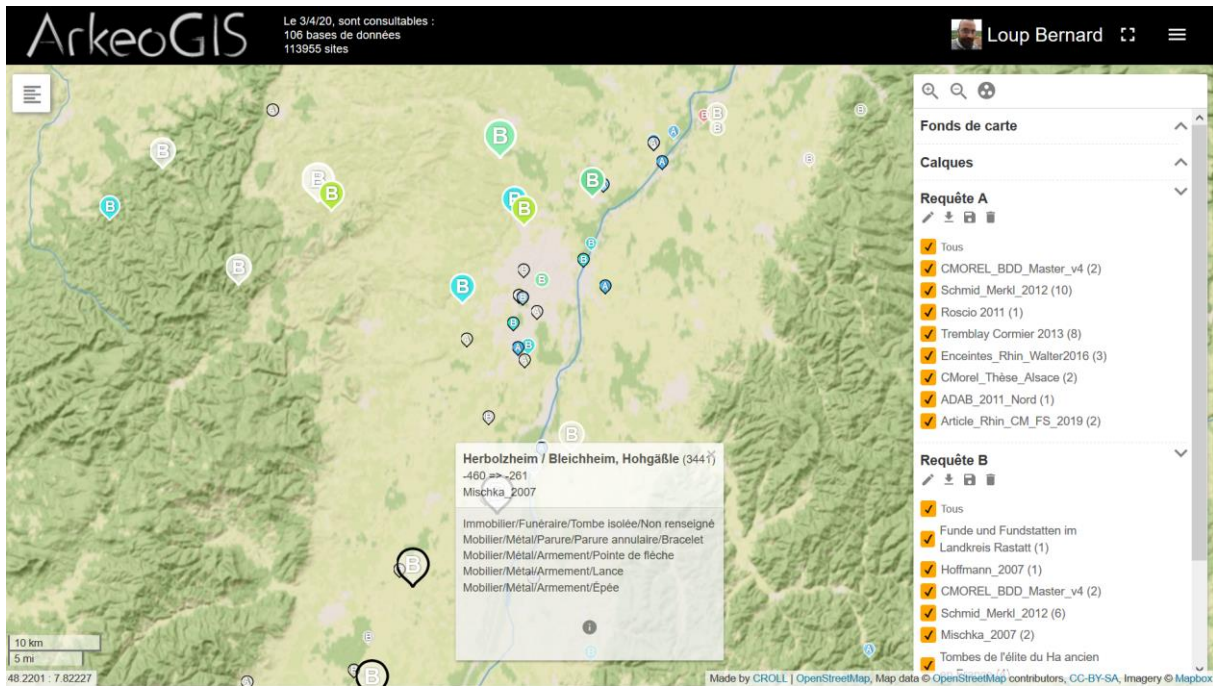


Figure 1. Screenshot: metallic weaponry in France and Germany, from Bronze Age (A), and Iron Age (B).

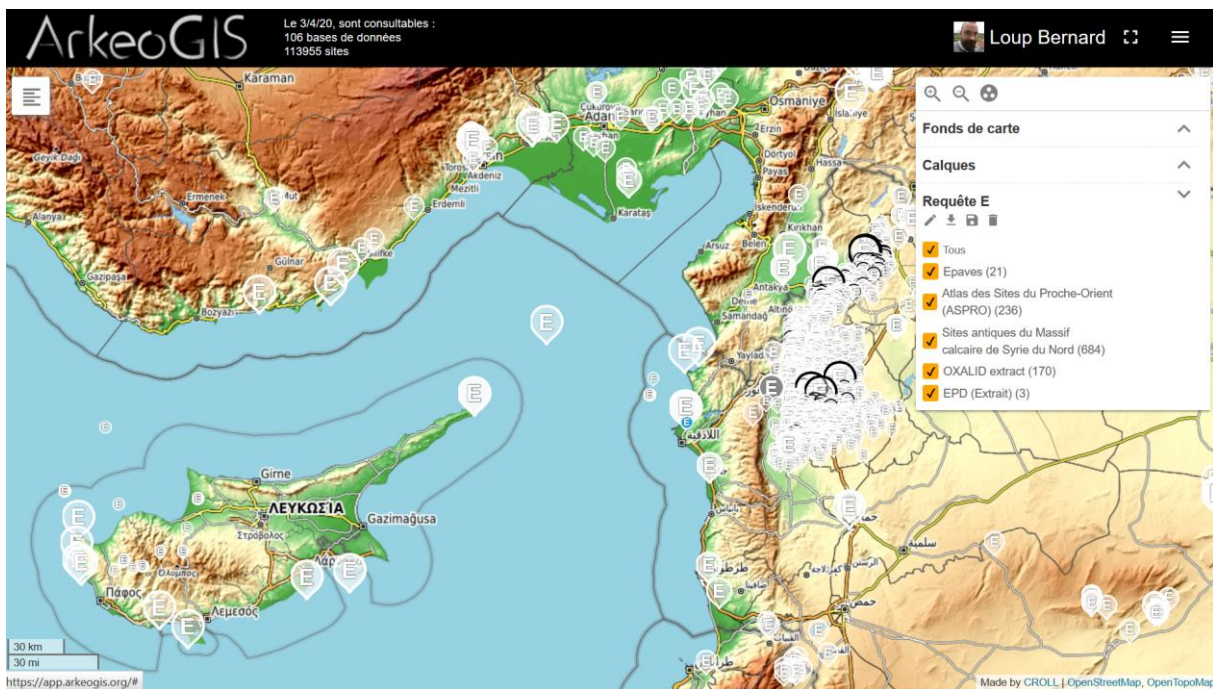


Figure 2. Screenshot: all shared data in ArkeoGIS in the eastern mediterranean.

ArkeoGIS can be used for many different forms of research, individual or collective. Among other things, the interface allows to handle the data management plan (DMP) for contractual researches. ArkeoGIS has proved a powerful tool for a variety of studies: excavations, syntheses, PhD theses; etc...

Tens of thousands of sites, objects and analyses are already available. Links to a number of other digital tools are also provided to inform users of their existence.

Every author entering localized data into ArkeoGIS keeps control over them and is the only one who can amend them. Any user can easily access other contributors' data and improve their own database. A directory allows researchers to contact each other. This initiative helps to foster scientific exchanges between countries and institutions.

### **1.2 Integration**

The data is processed by the users, who download and fill out a spreadsheet, choosing how much data they want to share. The main problem is encoding: we use UTF-8, but selecting an encoding method using Microsoft Excel appears difficult.

Assistance from one of our CNRS engineers with data alignment has been a very effective solution. Short-term grants (master/PHD internships) are only effective in areas where the student has already trained (i.e., an IT specialist should not be hired to encode archaeological data).

### **1.3 Hosting and legal solutions**

Hosted by Huma-Num, ArkeoGIS is a lasting solution. The CNRS's "very large research infrastructure" offers hosting and a wealth of useful tools that address most legal concerns. It is always difficult to fill the impressum and to find legal advice regarding licenses. Ultimately, fair use (i.e. quoting and explaining our choices) seems to be a robust solution.

## **II HINDRANCES TO DATA SHARING**

Over time, it has transpired that fear of computers/Internet, technical issues and lack of rewards are the main issues hindering data sharing.

### **2.1 Fear**

Fears about losing data, of having data simplified or reused without credit are very frequently expressed. It is sad to realise that sharing spreadsheets –even matching books or articles available in any library- is not accepted by most publishing scientists. Over 100 datasets are accessible to all users in ArkeoGIS, yet no one has published anything outside of their area of expertise: this is an argument in favour of sharing. The use of licensing (Creative Commons) also helps to reassure data producers, as does compliance with European directive INSPIRE.

### **2.2 Time, technology & languages**

Lecturers and researchers are pressed for time and in some cases not particularly technology-savvy, so the specifications required by a new tool (formatting/aligning, encoding, browser updates), can be off-putting. As language is often an issue, making the platform available in the user's language reduces risks of misunderstandings or mistakes.

### **2.3 Lack of incentives and competition**

The fact that online publications are denied "rank A" status publication definitely seems to be the biggest problem, resulting in a lack of incentives for sharing research. Worse yet, the fear that scholars from other universities might use the data is a significant hindrance as research institutions are increasingly competing over funding. Hopefully, the development of data papers will help resolve those issues.

### III ACCELERATORS OF DATA SHARING

Free access, clear definitions of uses and reuses and provision of significant amounts of data have proved conducive to accelerating data sharing.

#### 3.1 Free access and use

That users do not have to install any software or pay anything has been immensely helpful. Ideally, any online project should aspire to this. We considered changing our policy by charging fees to research institutions to maintain the platform, but found that this would not be an efficient solution, due to the bureaucracy involved and the overall lack of funding in research facilities.

#### 3.2 Avoiding black boxes and defining use and reuse

It is important that the users understand the way our tools work, and what the data they share will be used for. As a first step, giving them the choice to just highlight the existence of a new project or PhD, and then later the opportunity to share the raw data appears to be an efficient approach. We have limited access to non-specialists, and usually deny access to “big-data” researchers, as we consider ArkeoGIS as a tool for researchers, but not an object of study.

#### 3.3 Offering data and data papers

Any such project will attract genuine interest only after a critical mass of information has been made accessible. We noticed a sharp surge of interest after reaching 10.000 dots of information on the Upper Rhine valley. The platform could be even more attractive if data papers were offered to the authors.

### Conclusion

Data sharing is easy: once some basic fears and hindrances have been addressed, the gains will be so obvious that hopefully the next years will finally see truly fair data exchange worldwide, including in the digital humanities.

### References

more about ArkeoGIS here : <https://arkeogis.org/communication/>

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