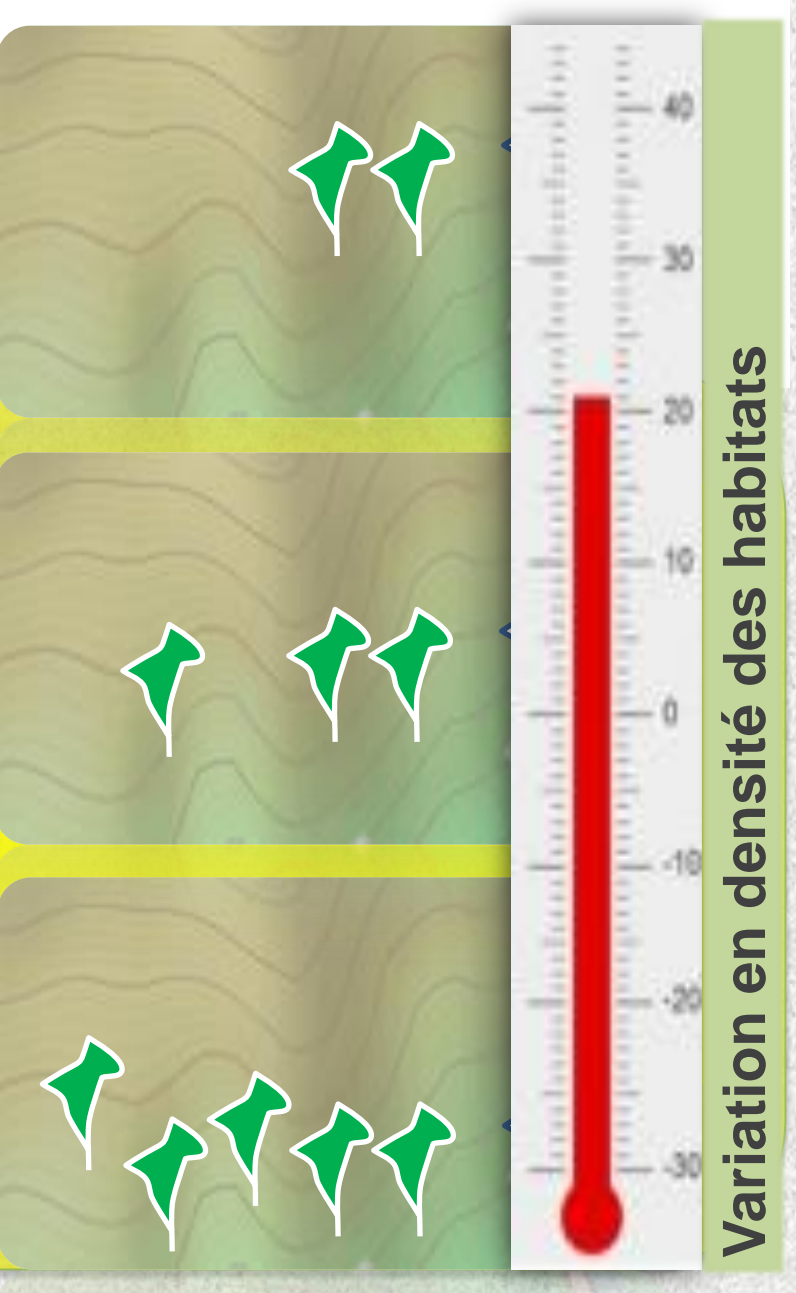


TOWARDS AN OBSERVATORY OF AROMATIC AND MEDICINAL PLANTS BIO-INDICATORS OF CLIMATE CHANGE

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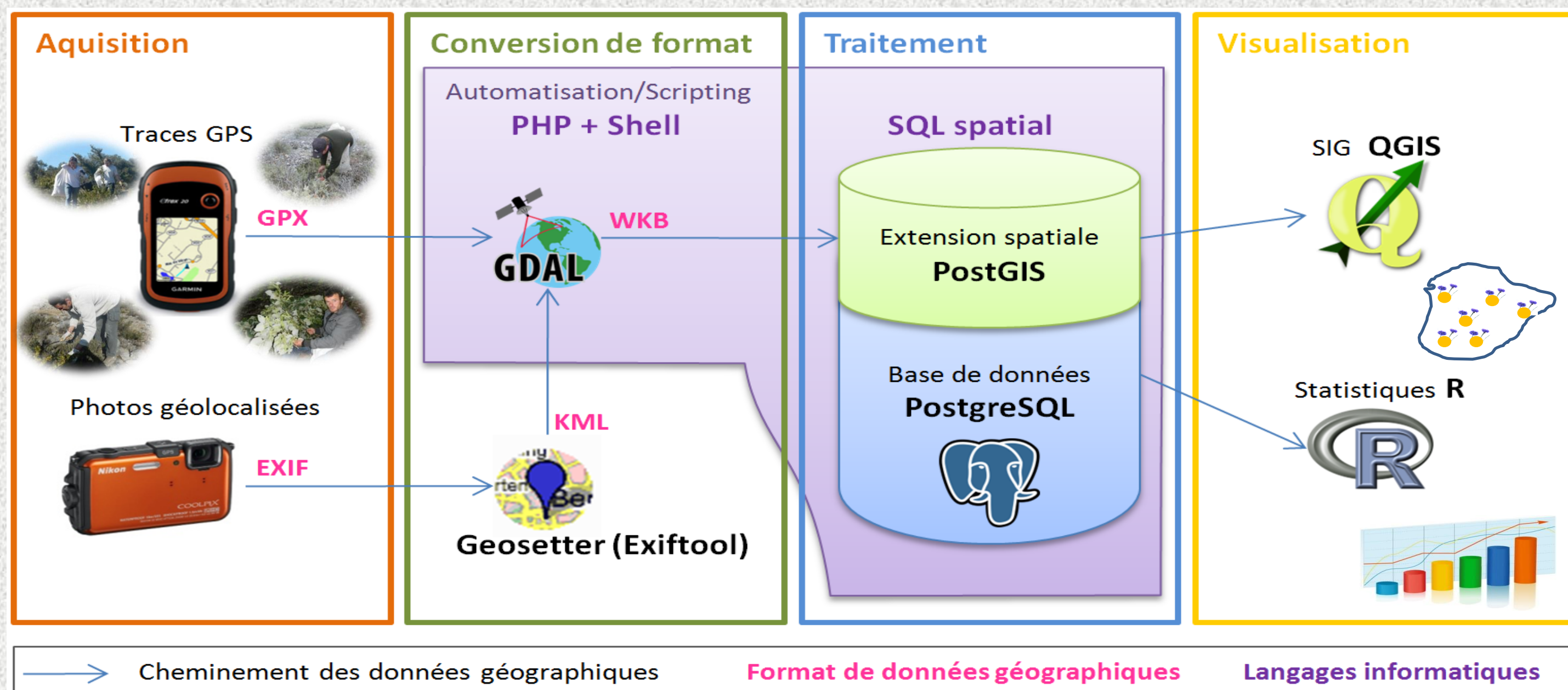
Instant zero

The plants adapt to climate changes and inform us about microbial life. The challenge is to produce systematic and structured information on aromatic and medicinal plants at instant zero. Unlike the existing inventory methods used by national and international organizations such as IUCN, WWF etc., the observatory will offer a method allowing to collect, structure and fusion different sources of information at time zero.

The idea of this observatory did grow during a research program and cooperation on natural resources led by CIHEAM-IAMM and funded by the FFEM in Albania. A thesis co-directed by the UMR TETIS and the CIHEAM-IAMM did develop this model.

Theoretical approach

Assuming that the gatherers indicate where the plants are, the idea is to follow them in order to share and structure their information. The approach is participatory (crowdsourcing) involving gatherers as information contributors. Their GPS tracks and their knowledge (name, quantity, etc.) contribute to identify and to characterize the gathering area (ZA). The aggregation in time and in space of the information allow to designate plants in their ecosystems.

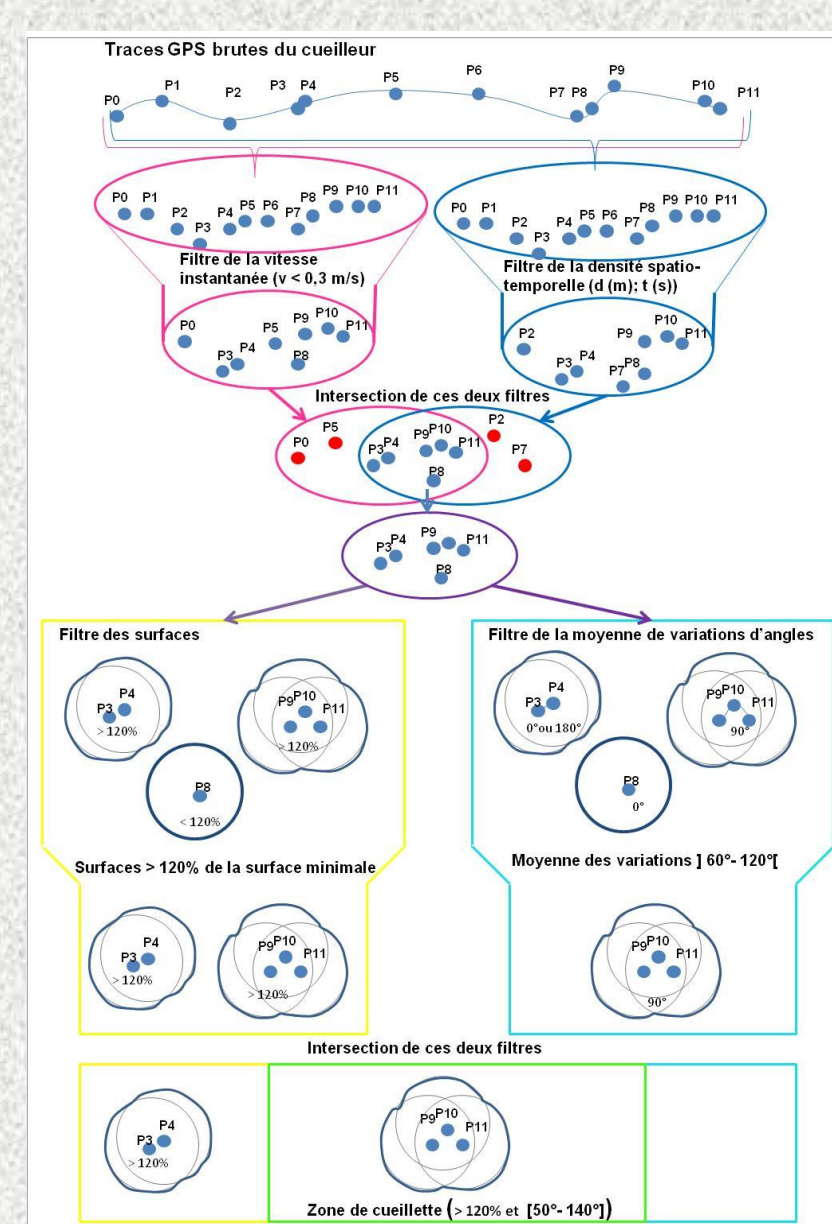


1. Mapping of gathering areas

The theoretical model is based on the successive application of four filters to isolate the GPS track segments designating the gathering area (ZA). The four filters are :

- ✓ Instantaneous speed
- ✓ Spatio-temporal density
- ✓ Minimum surface
- ✓ Average angle variations

It is through the aggregation of these gathering areas that we map the exploited habitat.



2. Evolution of the density of harvesting areas

This model is linked to daily regular information provided by different gatherers. This information is handled and interpreted. It allows to show the density of the gathering areas and their evolution through time.

Applications

- ✓ Highlight the problem of adaptation to the climatic variations through systematic surveys of the gatherers tracks in areas under high hydric stress in order to have comparable items.

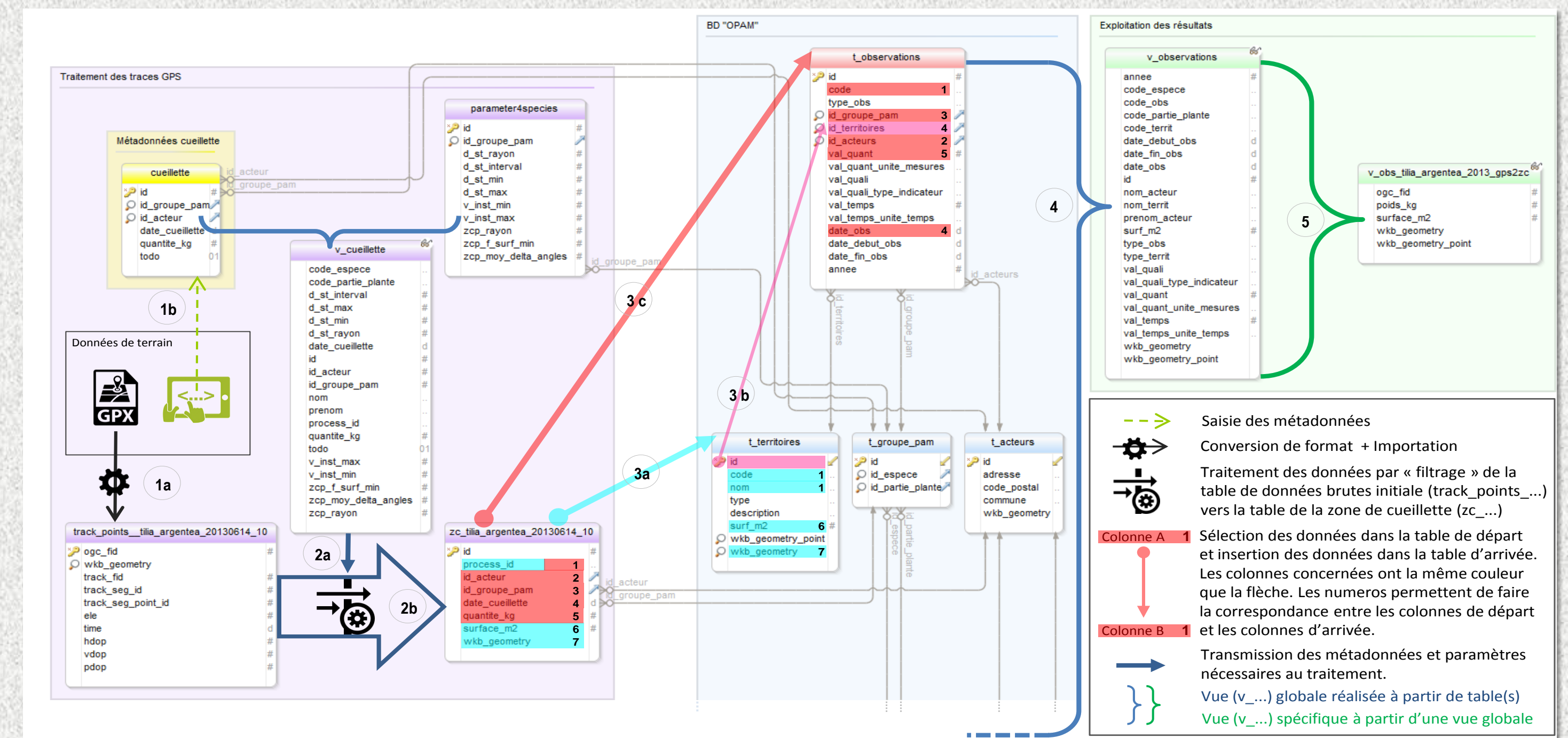
- ✓ Traceability

- ✓ Big Data observatory involves the creation of an innovative company and requires seeking new partnerships and funding.

Operational experimental model

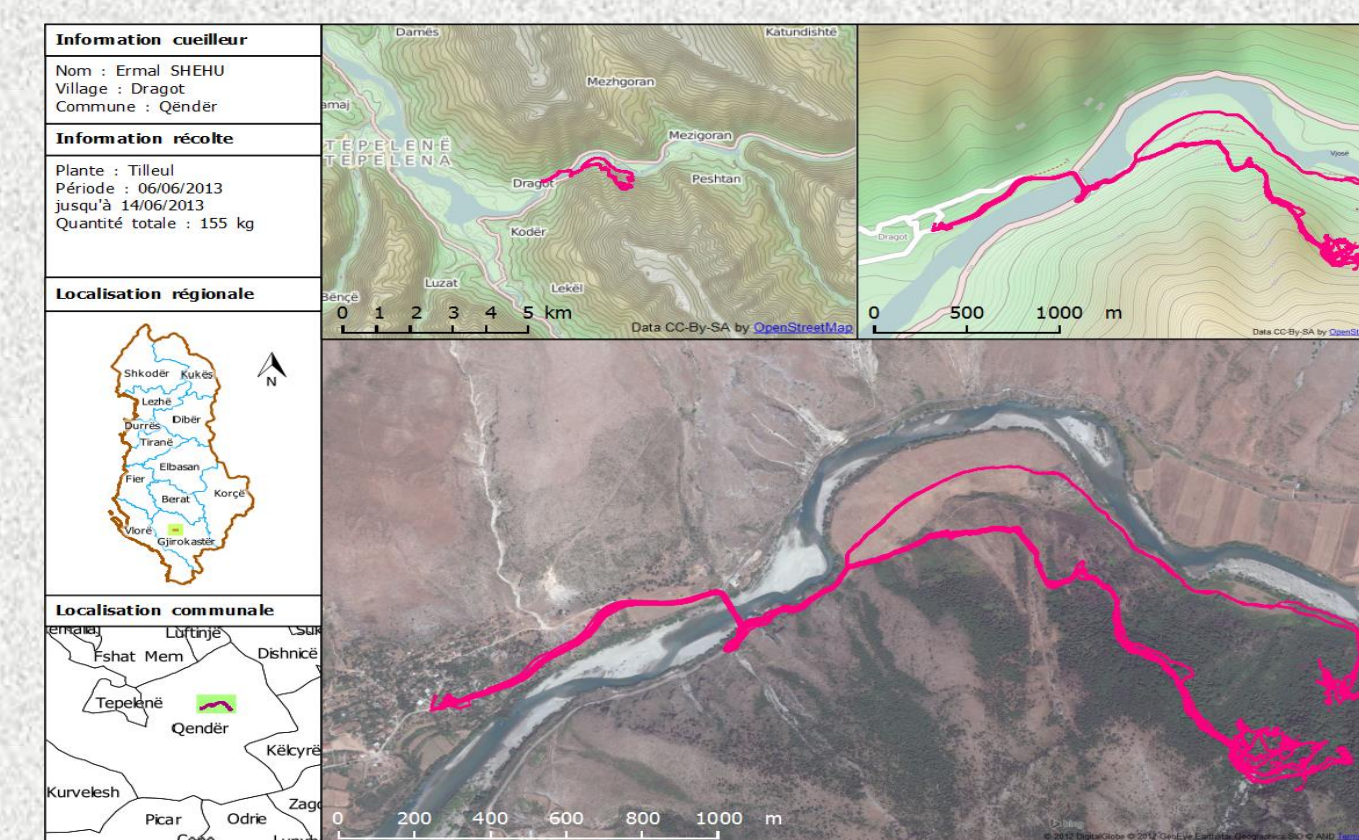
1. Automation data processing

Translation of the theoretical model in spatial SQL language.

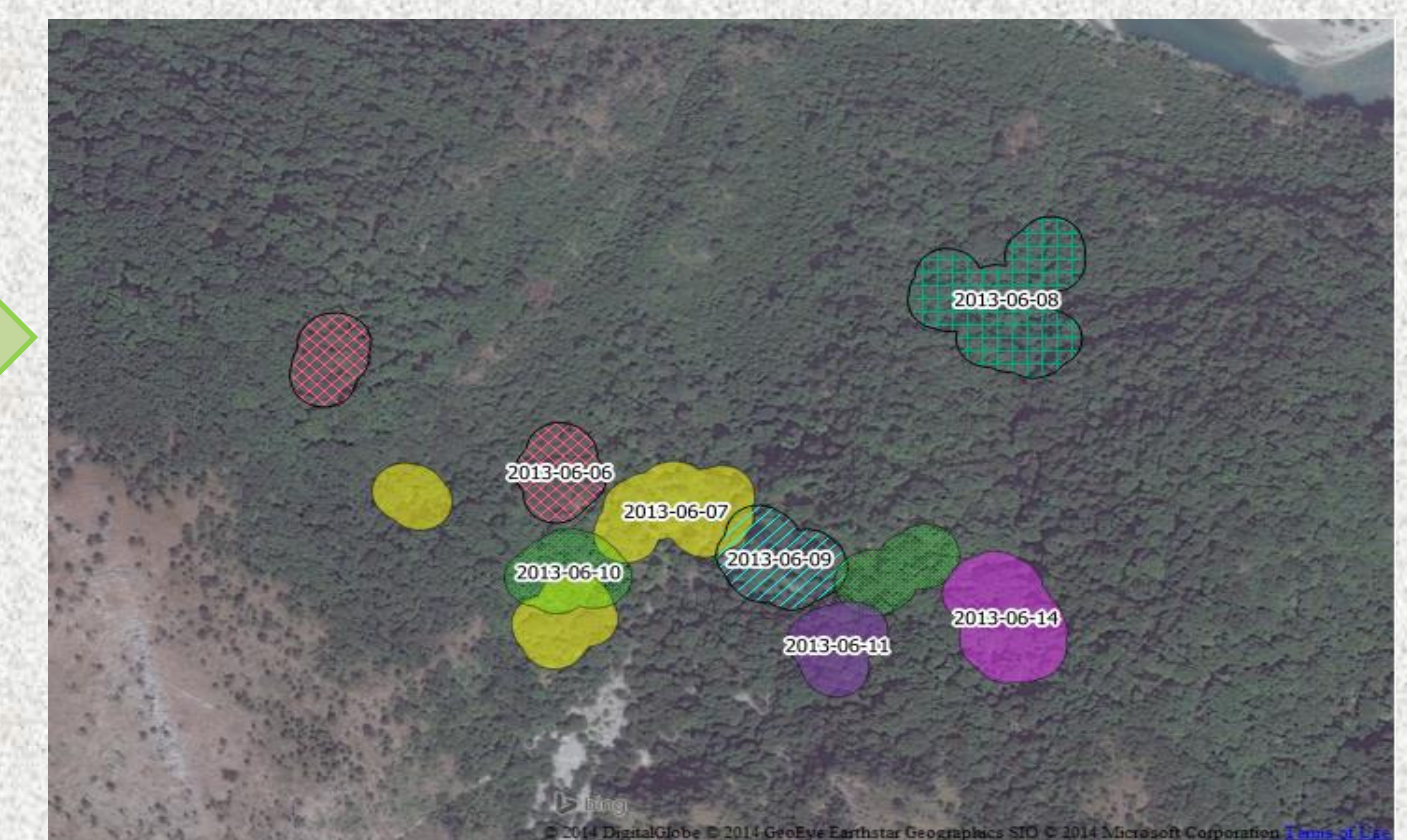


2. Reconstruction of the exploited habitat: the case of linden in Albania

2.1 General information and set of one week gatherer raw tracks.



2.2. Areas of gathering with their timestamps



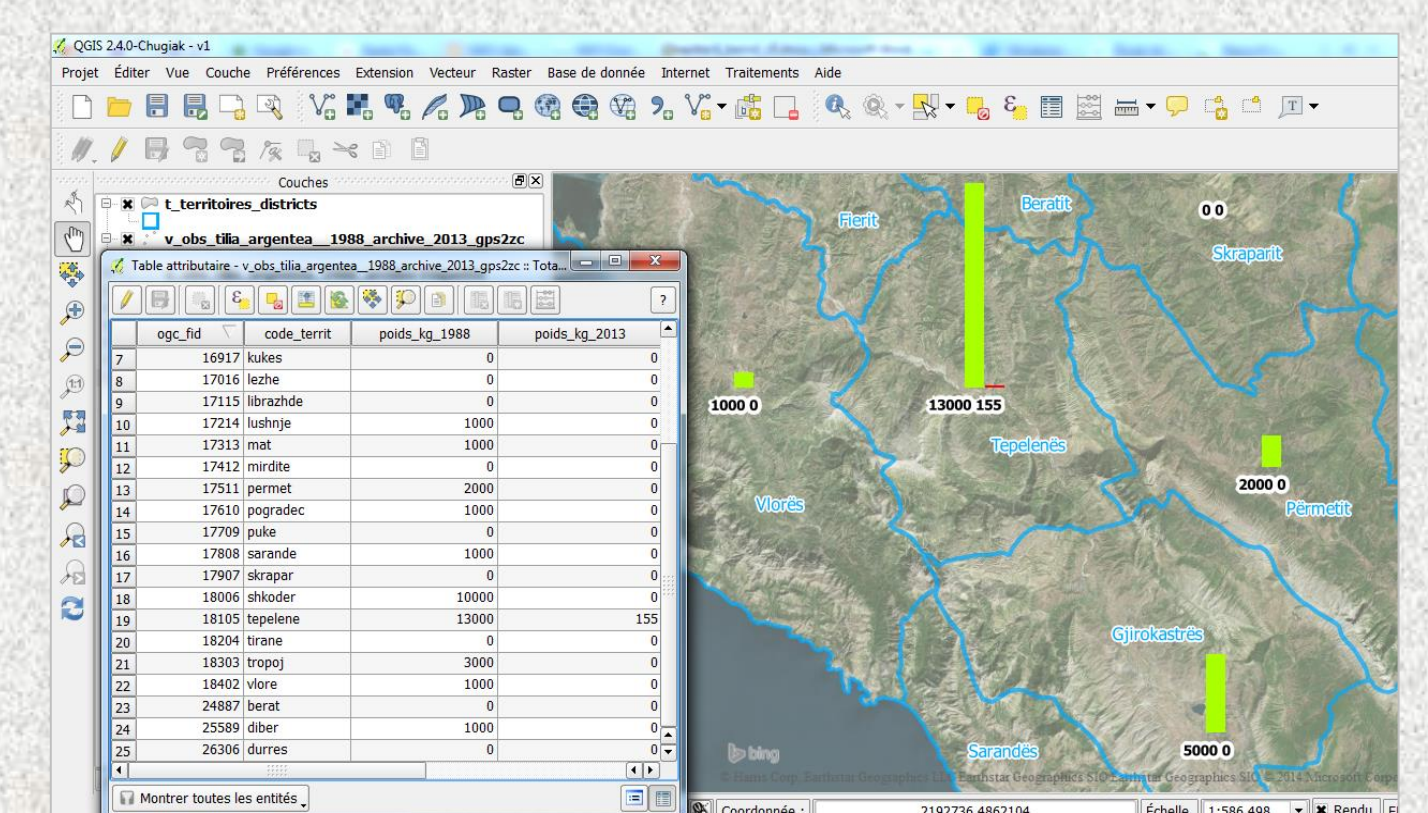
2.3. Mapping the exploited habitat aggregating time and space in an ongoing process



3. Adaptation to changes

3.1. Indicators of changes :

- ✓ Historical 1988 (green)
- ✓ Modelled data 2013 (red)



3.2. Necessary developments :

- ✓ Systematic survey of exploited habitats and analysis of zero time transfers between different gathering areas.
- ✓ Stages of test development and technology integration (GPS, smartphones).
- ✓ Interconnection with other sources of information: botanical, morphological, genetic, climatic etc.