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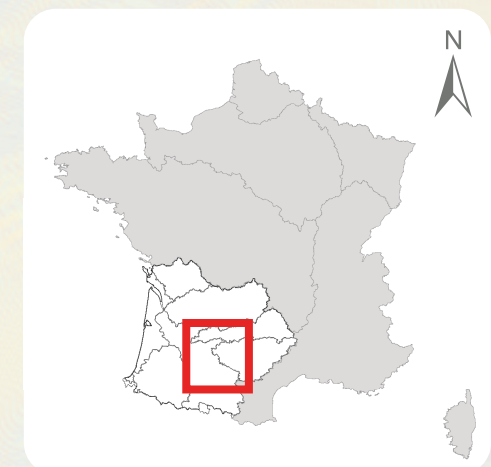
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# The Collective Research Project ChroTAIL

"Pleistocene chronostratigraphy of fluvial terraces between the Pyrenees and the Massif Central (Occitanie, France). Palaeoenvironmental and archaeological implications for Palaeolithic sites"



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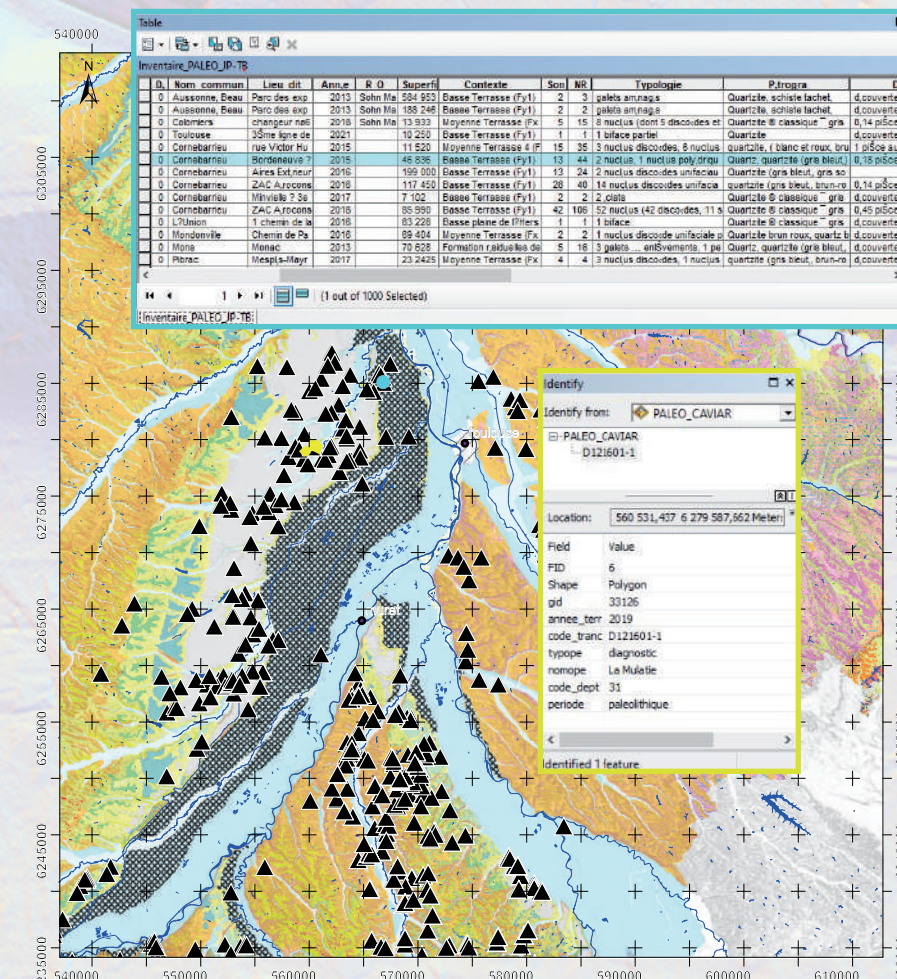
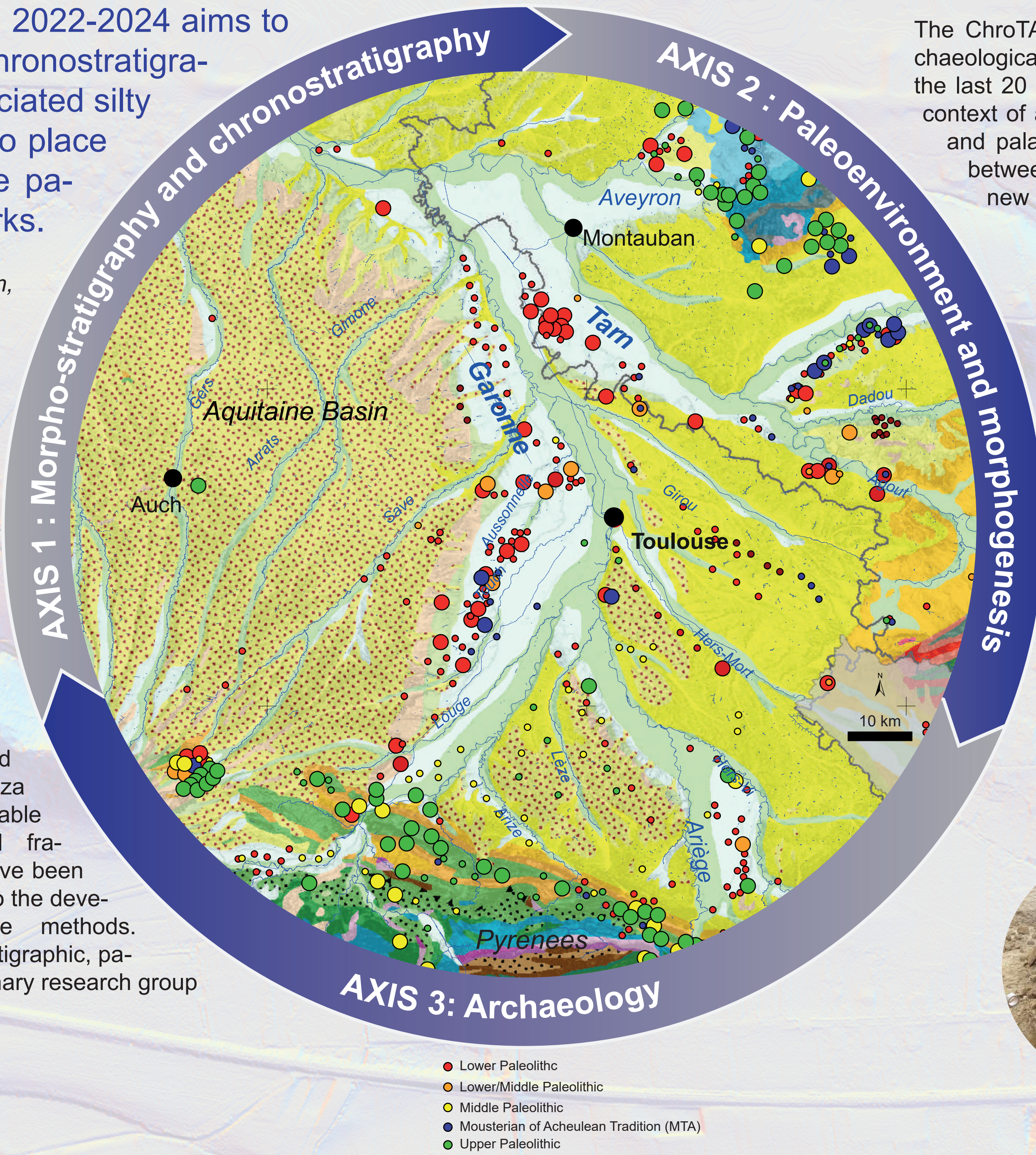
## CONTEXT

The Collective Research Project (CRP) ChroTAIL 2022-2024 aims to improve regional knowledge of the Pleistocene chronostratigraphic context of the fluvial terraces and their associated silty covers (Garonne and main tributaries) in order to place the Palaeolithic archaeological series in reliable palaeoenvironmental and chronoclimatic frameworks.

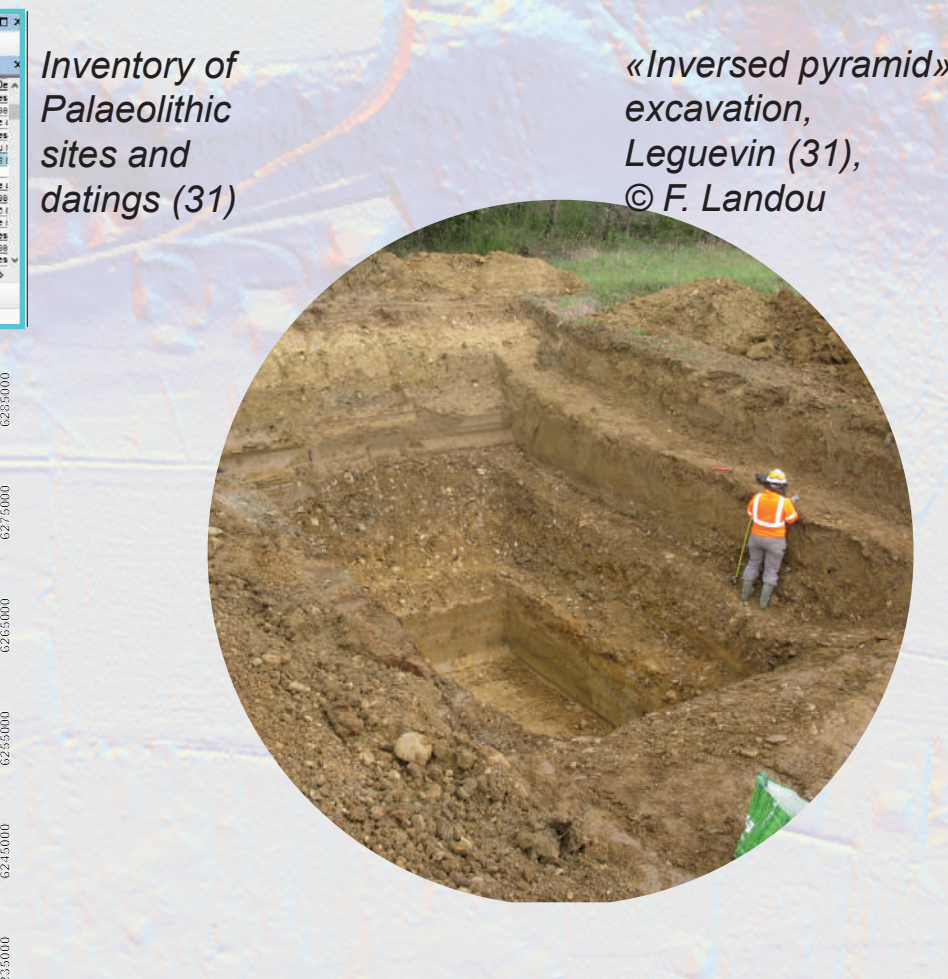
Within the tertiary molassic formations of the eastern Aquitaine Basin, between the Pyrenees and the Massif Central (southwestern France), the valleys of the Garonne River and its main tributaries (Tarn River, Ariège River, Aveyron River, Hers River, Save River, Aussonnelle River, ...) are characterised by well-preserved stepped and/or nested alluvial formations. Quaternary coarse fluvial deposits and their associated silty covers, occupy a large surface area within the basin. These past fluvial environments were logically heavily invested by human populations during the Pleistocene. In recent decades, the development of preventive archaeology has led to the discovery of numerous Palaeolithic sites, renewing our knowledge of the archaeological series and their morpho-sedimentary contexts (Bruxelles et al., 2003; Colonge et al., 2010; Jarry, 2010; Colonge et al., 2014). Recently, new data has been accumulating with preventive operations confirming the strong archaeological potential and the quality of the soil-sedimentary archives of the *Midi Toulousain* (Palaeolithic). Despite this, radiometric chronological markers are still rare. Although Holocene dynamics have been studied (Bruxelles et al., 2010; Valette & Carozza, 2010; Valette, 2011; Carozza et al., 2013), the valleys of the Garonne River watershed, still lacks reliable pedostratigraphic, morphostratigraphic and chronostratigraphical frameworks for the Pleistocene. However, methodological advances have been made in dating these sedimentary contexts (geochronology) thanks to the development of OSL, IRSL, ESR or cosmogenic radionuclide methods. A revision and a reinforcement of the regional Pleistocene chronostratigraphic, palaeoenvironmental and archaeological frameworks by an interdisciplinary research group are therefore needed and planned.

## DATA

The ChroTAIL CRP identifies and inventories high-potential soil-sedimentary and archaeological sequences discovered during archaeological operations carried out over the last 20 years. At the same time, during preventive archaeology operations in the context of alluvial terraces, the effort of sedimentary sampling, and geochronological and palaeoenvironmental related studies is increased. Correlations are proposed between ancient and recent sequences. Models are tested and strengthened as new data are acquired (diagnostics and archaeological excavations)



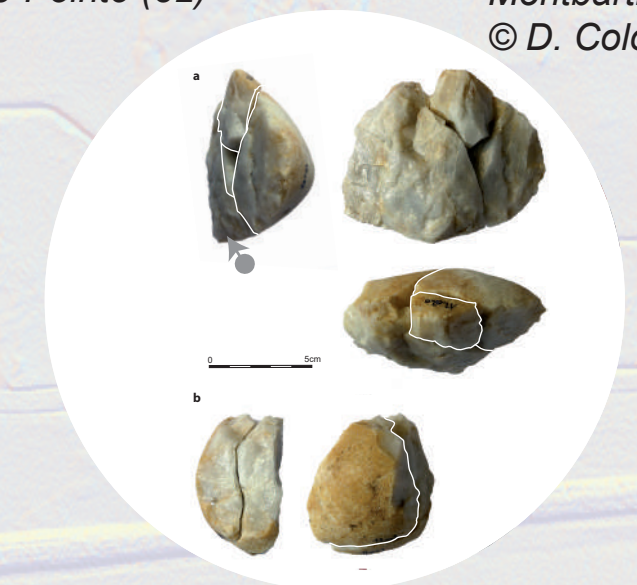
Inventory of soil-sedimentary and archaeological data



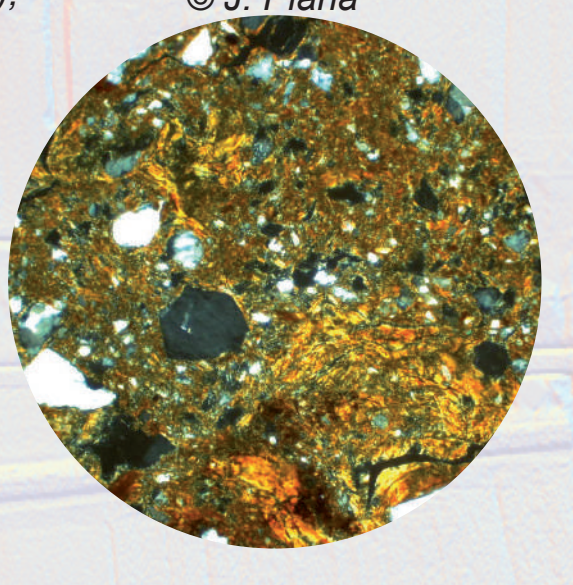
Field survey and sampling (preventive archaeology)



OSL dating

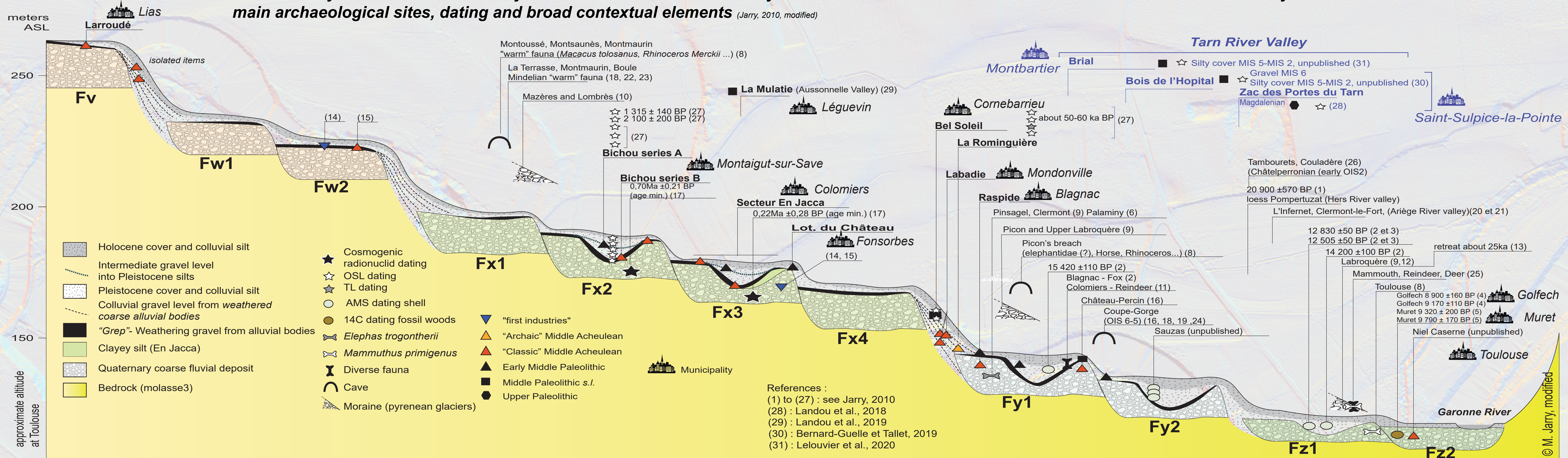


Typo-technologic studies



Sedimentary and micromorphological analysis

## Schematic synthesis of the terrace system in the Garonne River valley near Toulouse and first correlations with the Tarn River alluvial system : main archaeological sites, dating and broad contextual elements (Jarry, 2010, modified)



## OBJECTIVES AND EXPECTED RESULTS

### Axis 1: Construction of morpho-stratigraphic and chronostratigraphic models

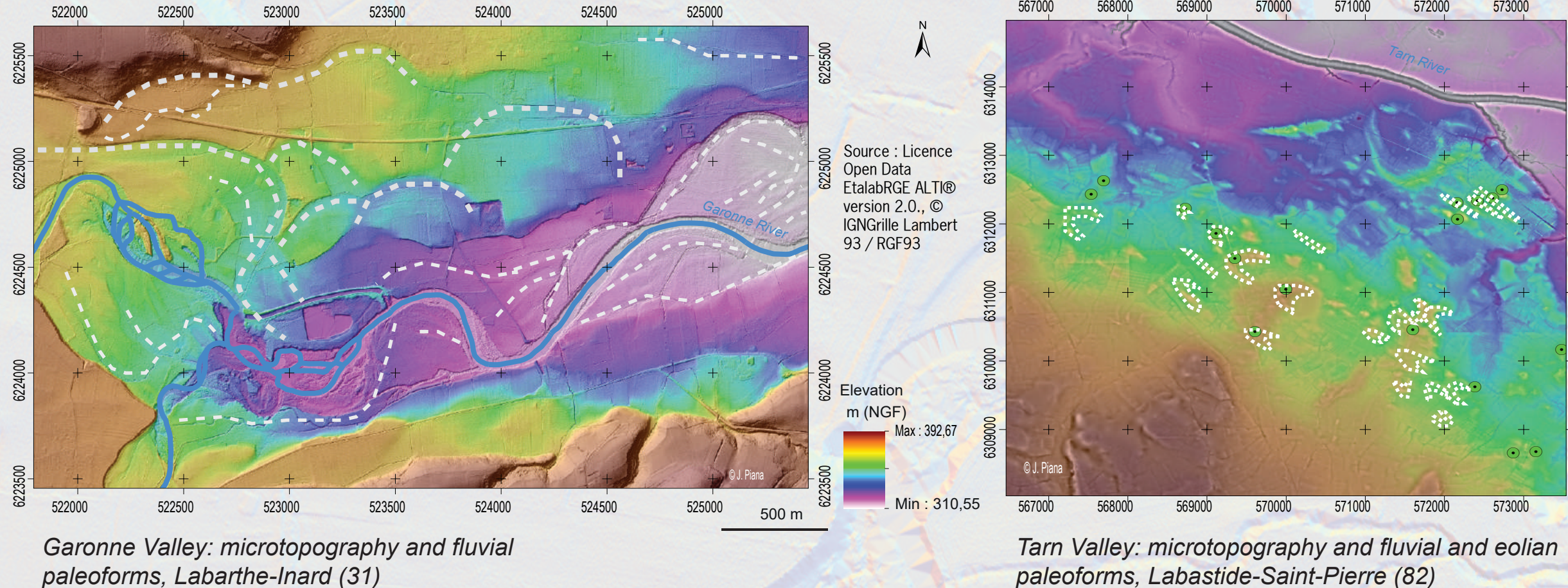
- Characterisation of the geometry and lithofacies (fluvial alluvial, eolian, colluvial, etc...) of the main sediment bodies of the terraces;
- Dating of the main sediment bodies of the terraces (coarse fluvial deposits and silty cover);
- Identification of major erosional periods or sediment hiatuses that can be compared to archaeological ones;
- Evaluation and exploitation of the potential of the soil-sedimentary archives (interglacial and glacial periods);
- Inter-regional comparison of the Midi-Pyrenean models along a latitudinal gradient (Antoine and Locht, 2015; Deschodt, 2014; Liard et al., 2017; Despriée et al., 2009; Sellami, 1999; Bertran, 2020; Delmas et al., 2012, 2015; Castanet 2008, Castanet et al., 2015; Despriée et al., 2014) and according to the longitudinal gradient (oceanicity/continentalty) (Bosq et al., 2018; Boenigk and Frechen, 2005; Hagedorn et al., 2008; Antoine et al., 2001).

### Axis 2: Characterisation of palaeoenvironments and river valleys morphogenesis

- Fluvial and fluvio-eolian landscapes and dynamics associated with the morpho-sedimentary dynamics (glacial and interglacial periods)
- Sediment and incision-aggradation processes in response to environmental and climate changes (alternating periglacial and temperate conditions, permafrost/paleosoils changes, water and sediment discharge changes)
- Variability of the palaeoenvironment and morphogenesis along an upstream-downstream gradient, from the Pyrenees to the Atlantic Ocean (Delmas et al., 2012; Bertran et al., 2020) and along the French and the mid-latitude western Europe latitudinal and longitudinal gradients.

### Axis 3 : Archaeology

- Determination, among the available sedimentary series, of different taphonomic facies and evaluation of their informative potential and their reliability for chronocultural interpretation;
- Redefinition/validation of the technocomplexes, proposal of an archaeo-sequence of the major chronocultural facies and their integration into the archaeo-stratigraphy with chronological arguments ('absolute' datings).
- Collective reflection on settlement trajectories and palaeoenvironmental dynamics, with the support of models. The main soil-sedimentary and archaeological discontinuities identified at different scales will be discussed in the context of the spatial analysis of the sites (choice of location, taphonomic bias).



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