Contribution of sedimentology to reconstruct the palaeoenvironments of late Carboniferous to Permian basins of the northeastern Massif central, France

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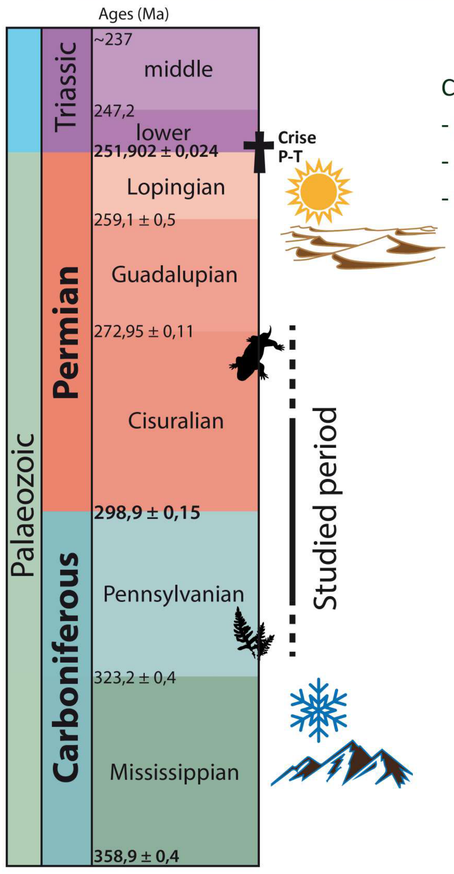
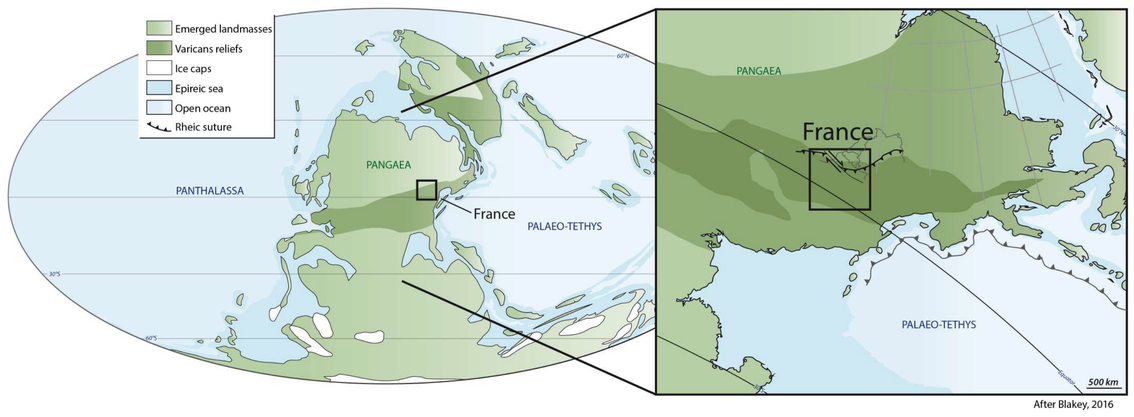
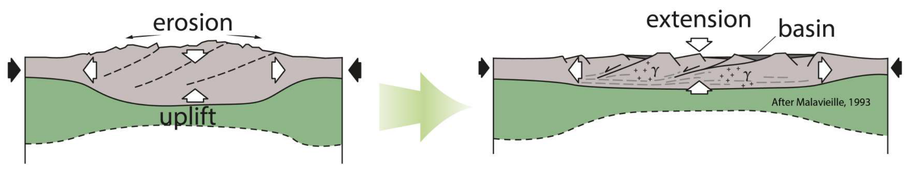
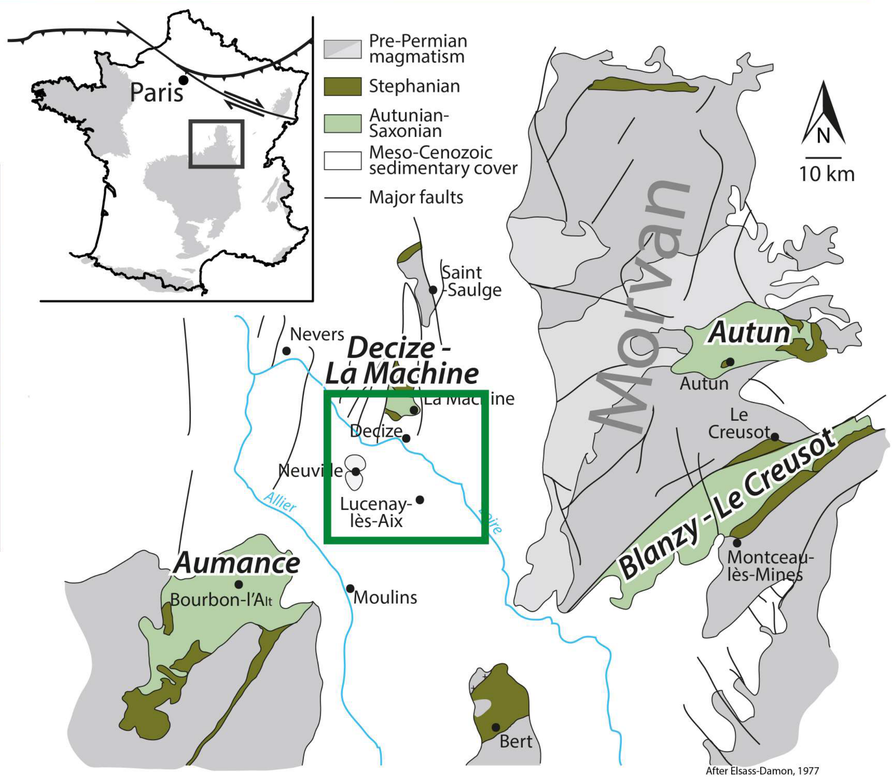


Carboniferous to Permian transition is ascribed into a geodynamic transition with:
- palaeogeographic reorganisations
- a transition from an icehouse (Late Palaeozoic Ice Age) to a greenhouse climate
- the Variscan relief destruction





Geological setting



Material

Cored boreholes
Field analyses
Well-logs
Seismic profiles

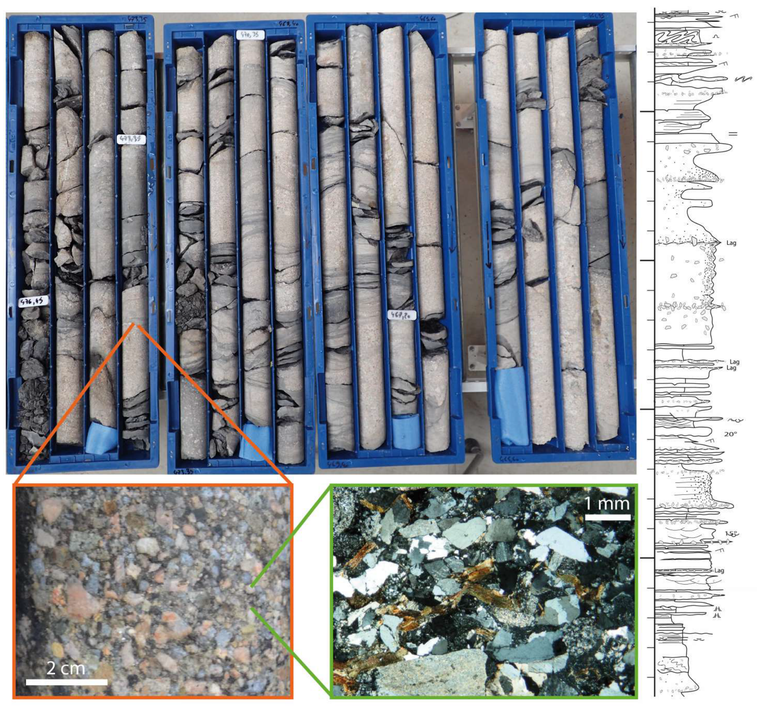
Depositional environment
Palaeogeography

Methods

Architecture characterisation
Facies and facies association determinations
U/Pb CA-ID-TIMS & LA-ICP-MS dating on zircons and apatites

Facies sedimentology

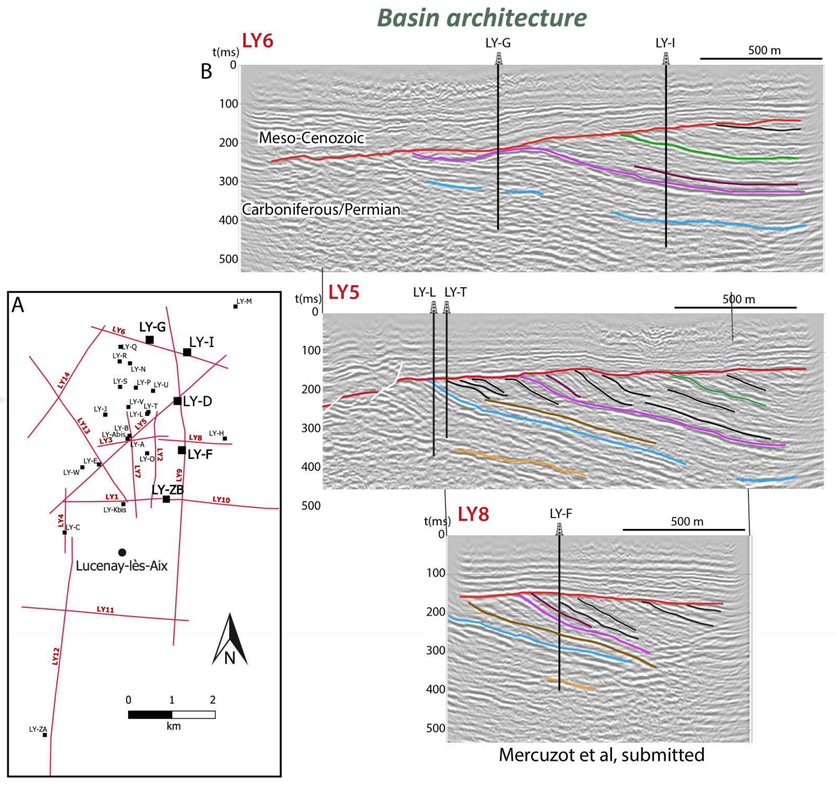
from core to thin section



Micro and macrofacies descriptions, sedimentary logs to determine the depositional environment

Seismic data, sequence stratigraphy and well-log integration

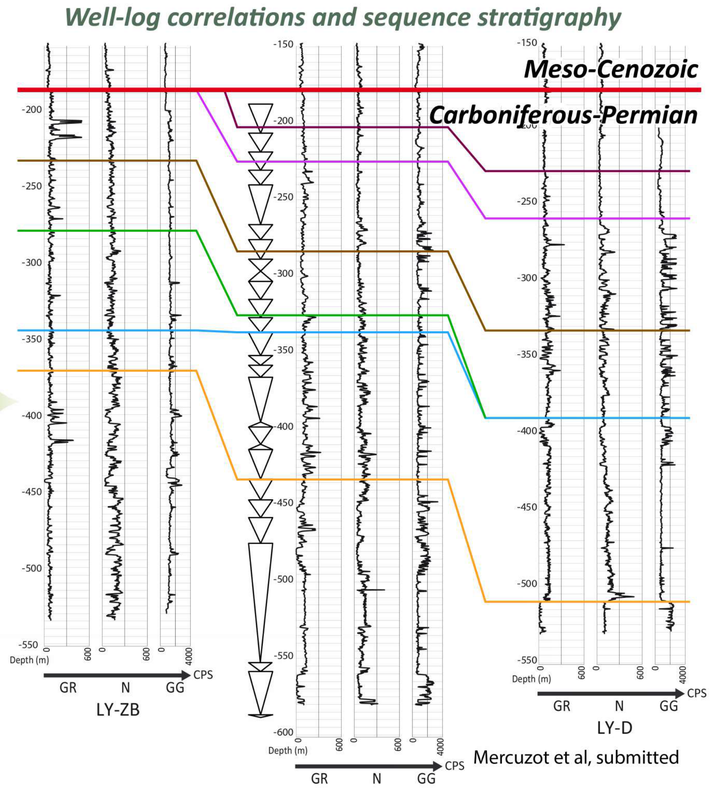
Basin architecture



Mercuzot et al, submitted

A. Localisation of the seismic profiles and wells in the Lucenay-lès-Aix area.
B. Interpretation of the seismic profiles LY-6, LY-5 and LY-8 showing the structure of the basin.

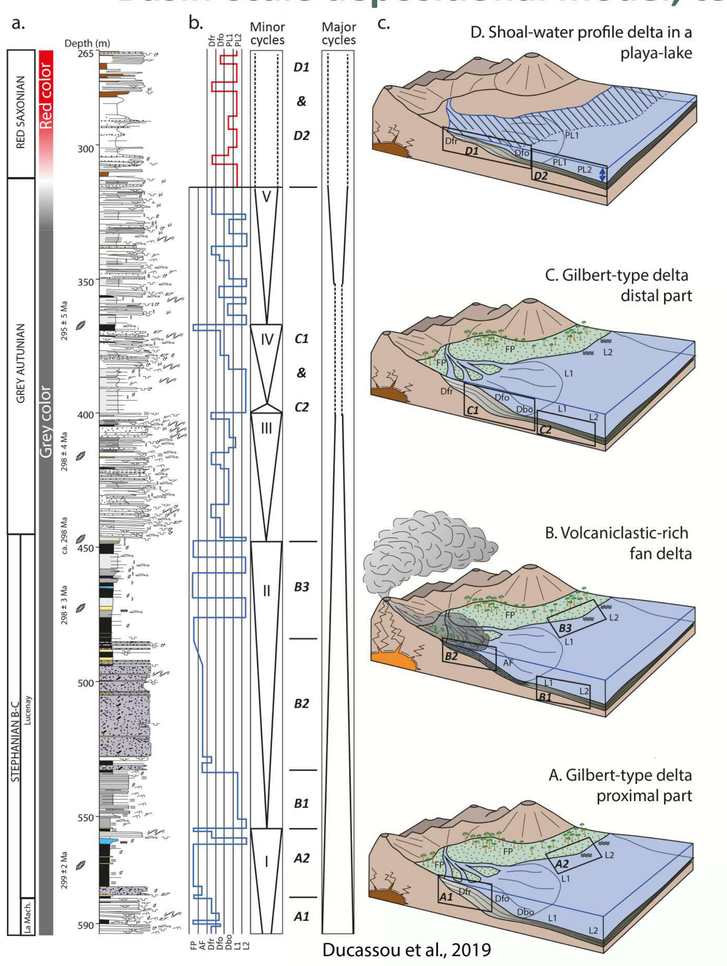
Well-log correlations and sequence stratigraphy



Mercuzot et al, submitted

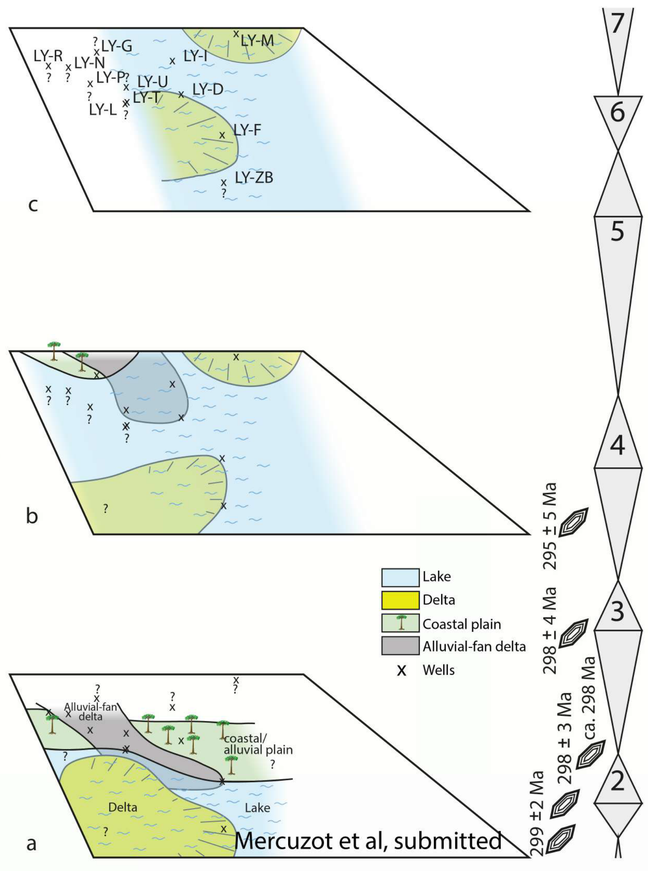
Correlations based on seismic markers of the LY-ZB, LY-F and LY-D wells. When observed, the "Red Permian" is represented in red at the top of the wells.

Basin-scale depositional model, temporal evolution, palaeogeography



Ducassou et al., 2019

Landscape reconstruction and evolution based on the LY-F well: a) Synthetic sedimentological log on which are reported the U-Pb ages on zircon and the change of color of the sedimentary series (the attribution to the different units and formations is from Donsimoni, 1990).; b) Depositional profiles and stratigraphic cycles; c) Palaeogeographical sketches (noted from A to D) on which are reported the facies associations.



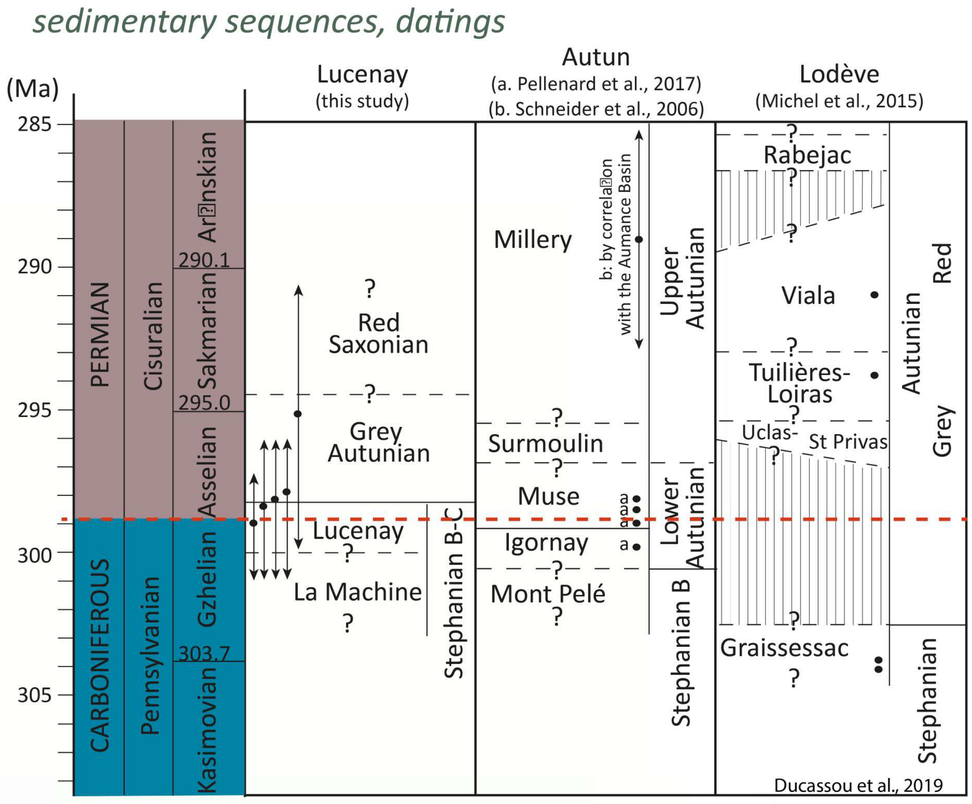
Mercuzot et al, submitted

Palaeogeographic maps showing the depositional environment evolution through time at the scale of the basin. The basin seems to open toward the east. The main stratigraphic cyces are represented.

Perspectives

Inter-basinal correlations - connexions between the basins ?

sedimentary sequences, datings



Correlations between the Lucenay-lès-Aix area, the Autun and the Lodève basins. Here the terms "Stephanian B-C", "Grey Autunian" and "Red Saxonian" for the Lucenay area correspond to lithostratigraphic units as given in the literature (Donsimoni, 1990), not to local stratigraphic stages.

Ducassou et al. (2019). Sedimentology and U-Pb dating of Carboniferous to Permian continental series of the northern Massif Central (France): Local palaeogeographic evolution and larger scale correlations. Palaeogeography, Palaeoclimatology, Palaeoecology, 533, 109228.

Mercuzot et al., submitted. Palaeoenvironmental reconstitutions at the Carboniferous-Permian transition south of the Paris Basin, France: implications on the stratigraphic evolution and basin geometry. Submitted to International Journal of Earth Sciences.