

Université de Picardie Jules Verne
Ecole Doctorale Sciences, Technologie, Santé (ED 585)
EDSTS - UPJV

PhD title :

***Fen peat of Somme river valley: Historical Ecology and trajectories,
between climate control and anthropogenic impact***

Doctoral research project proposed by **EDYSAN UMR7058** (University of Picardie Jules-Verne, Amiens), in partnership with **LGP-CNRS-Meudon** (UMR 8591 CNRS-Universités Paris 1-UPEC), the **Department of the Somme**, the **Conservatory of Natural Areas in Picardy** and the **National Botanical Conservatory in Bailleul**. This project is funded by the **Department of the Somme** and the **Artois-Picardie Water Agency**.



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Context, Issues, Problems:

The fluviogene alkaline peatlands constitute natural environments that have become rare and which require special conservation measures due to the exceptional nature of their biodiversity. In addition (in a non-degraded state) these densely vegetated wetlands are likely to play a role in the fight against global warming via their capacity to sequester CO₂ (Gewin 2020). The wetlands at the bottom of the Somme valley (Hauts-de-France) contain one of the largest alkaline fen peat in Western Europe and constitute a remarkable humid environment, recently recognized by the international "Ramsar" label. In this environment at the bottom of the valley

with a shallow water table, the turfigenesis is fed by waters rich in calcium and at neutral / basic pH due to the chalk aquifer contribution (Upper Cretaceous). The sedimentary sequences of the alluvial plain are including subcontinuous peat layers up to 3 to 5 m thick. On the other hand, due to the significant anthropization of the valley, witnesses of turfigenesis still active today are very rare (Lebrun et al., 2014). These witnesses presumably subsist under conditions of plant cover, hydrodynamics, and water chemistry that are singularly different from those in which the fossil peat from valley bottom clogging has formed. Research carried out in the years 1990-1999 on the bottoms of the Somme valley and its tributaries showed that fen peat begins to form around 10,000 years ago at the very beginning of the Holocene, at the bottom of abandoned channels. They then develop continuously throughout the first half of the Holocene; a period during which their extension leads to a generalized peat clogging of the alluvial plain (Antoine, 1997a, b, Antoine et al., 2002). Following an erosion phase dated to the middle of the Atlantic period around 6000 years ago, a general decline in peat formation is observed, the reasons for which are still to be explored. This observation raises both the question of the origin of this modification of the valley bottom environments (climatic and / or anthropic) and that of the environmental conditions which allowed the continuation and / or the localized resumption of turfigenesis making the peat levels observed within the more recent part of the sedimentary clogging of the valleys. With the ambition to restore a favorable environment for peat formation (link [here](#) with the Life Anthropofens project carried out by CEN Hauts-de-France), it is essential to characterize before the succession of different types of paleoenvironments in which peat has grown in the past (Williams, 2011). This approach indeed makes it possible to produce benchmarks prior to the first traces of anthropization of the environment associated with occupations of the ancient Neolithic dating from around 6000 years calBP in the Somme (Antoine et al., 1997b). A new research effort is therefore absolutely necessary in order to define reference states and ecological restoration trajectories for the Somme valley and its fen peat on robust scientific bases and with a long-term perspective. The stake is all the more strong as these alkaline fen peat still partially active rest on formations of Holocene peat whose geological, paleoenvironmental and ecological history during the last millennia is still paradoxically little known.

Funding: Departmental Council of the Somme (research allowance and complete thesis environment (field, analyzes and datings). Allocation on project from the Department of the Somme.

Remuneration: € 2,700 Gross Charged Monthly (amount slightly higher than the standard of the ministry's doctoral contracts).

Name of the thesis directors:

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Disciplinary Fields: Pedology, Geomorphology, Paleoecology

Keywords: Alcaline peat, anthropisation, erosion, sedimentation, eutrophication,

Skills required for candidates:

Scientific training at Master 2 level or engineering degree in :

- Environmental geosciences, or
- Physical geography and environment, or
- Water / soil sciences, or
- Environmental science, Biogeochemistry, or
- Archeosciences / Geoarchaeology.

Previous experience in quaternary environmental studies, river valley bottom environments, peat, or carbon storage in soils will be an advantage. Expertise in the analytical fields and methods listed in the methodology section will also be appreciated.

The following qualities will be particularly appreciated:

- Autonomy and organizational capacities (data collection and research, implementation of field campaigns),
- Ability to master a multidisciplinary approach and collaborate as a team,
- Motivation & determination for field work (drilling and coring) and laboratory analyzes,
- Writing skills (French and English) and ability to structure documents and for CAD.

Finally the candidate will need to move in the department, the car driving licence will be necessary. The qualities and motivations of the candidate will be evaluated during the selection process which will be organized by the Doctoral School of the Université de Picardie in September 2020. Only the best candidates will be heard, by videoconference, in the second half of september 2020.

Candidature File :**1- Curriculum Vitae + motivation letter****2-Transcripts of the last 3 years of study (including Licence 3 or equivalent)****3-Rank of classification and numbers of the promotion****4-Master's degree or equivalent**

Students who have not yet validated their M2 must provide:

- Letter of appreciation by the training manager
- Letter of appreciation from the internship manager

5-Letters of recommendation

It will be sent by email in PDF format to the management team at the latest on **09/18/2020 midnight** at the following addresses: pierre.antoine@lgp.cnrs.fr and boris.brasseur@u-picardie.fr

For the candidates selected, an oral selection (by videoconference) should take place the week following the end of the applications.

References :

- ANTOINE, P. (1997a) - Evolution tardiglaciaire et début Holocène des vallées de la France septentrionale : nouveaux résultats. *Comptes-rendus de l'Académie des Sciences, Sciences de la Terre et des Planètes* 325, 35-42.
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- ANTOINE, P., FAGNART, J.-P., AUGUSTE, P., COUDRET, P., LIMONDIN-LOZOUET, N. & PONEL, P. (2012) - Synthèse des données : évolution des environnements de la vallée de la Selle au Tardiglaciaire et au début de l'Holocène et relations avec les occupations préhistoriques. In : Antoine, P. et al., Conty, vallée de la Selle (France) : séquence tardiglaciaire de référence et occupations paléolithiques. *Quaternaire Hors-série n° 5*, 127-147.
- Gewin V (2020) How peat could protect the planet. *Nature* 578:204–208. <https://doi.org/10.1038/d41586-020-00355-3>
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To discover the working environment in pictures: To discover the field site in which this work will be carried out, potential candidates are invited to consult the 5 videos on this web page:

<https://www.somme.fr/services/environnement/preservation-de-la-biodiversite/les-vallees-de-somme-et-de-lavre-labellisees-ramsar/>



écologie et dynamique
des systèmes anthropisés



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