

# Spatial variations, origins, and risk assessments of polycyclic aromatic hydrocarbons in French soils

Claire Froger<sup>\*a</sup>, N. P. A. Saby<sup>a</sup>, C. C. Jolivet<sup>a</sup>, L. Boulonne<sup>a</sup>, G. Caria<sup>b</sup>, X. Freulon<sup>c</sup>, C. de Fouquet<sup>c</sup>, H. Roussel<sup>d</sup>, F. Marot<sup>d</sup>, A. Bispo<sup>a,d</sup>

\*Corresponding author: [claire.froger@inrae.fr](mailto:claire.froger@inrae.fr)

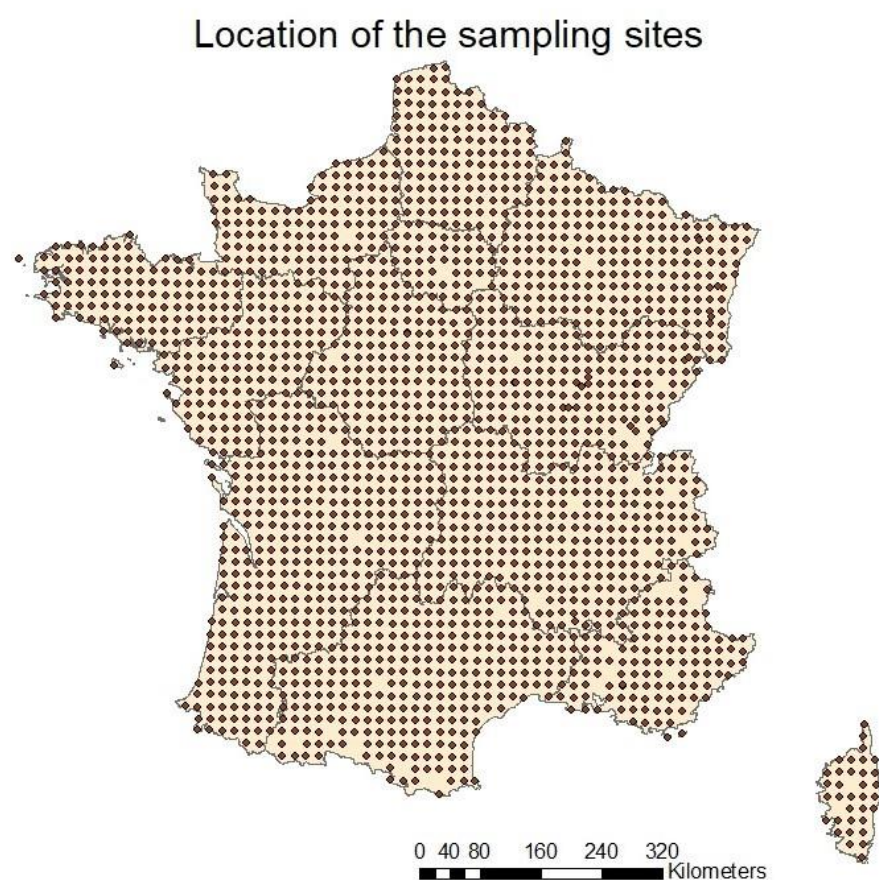


Figure S 1 Map of the sampling sites over France, based on the 16 x 16 km grid [1]

Table S 1: Uncertainties values of PAH concentrations based on the integration of standard error of both repeatability and internal reproducibility. For each PAH concentration, uncertainty is calculated as :  $U = a[C] + b$

	a	b
Acenaphthene µg/kg	0.37	2.00
Anthracene µg/kg	0.47	1.00
Benzo(a)anthracene µg/kg	0.38	2.00

Benzo(ghi)perylene µg/kg	0.16	10.00
Benzo(k)Fluoranthene µg/kg	0.20	1.00
Chrysene µg/kg	0.32	10.00
Dibenzo(a,h)anthracene µg/kg	0.18	4.00
Fluorene µg/kg	0.58	1.00
Indeno(1,2,3-cd)pyrene µg/kg	0.21	2.00
Naphthalene µg/kg	0.31	4.00
Phenanthrene µg/kg	0.31	2.00
Pyrene µg/kg	0.27	2.00
Acenaphthylene µg/kg	1.98	0.002
Benzo(a)pyrene µg/kg	0.23	9.01
Benzo(b)Fluoranthene µg/kg	0.22	9.01
Fluoranthene µg/kg	0.27	11.18

Table S 2 Toxic equivalent factor for PAH [2,3]

PAH molecule	Toxic equivalent factor
Naphthalene	0.001
Acenaphthene	0.001
Fluorene	0.001
Phenanthrene	0.001
Anthracene	0.01
Fluoranthene	0.001
Pyrene	0.001
Benzo(a)anthracene	0.1
Chrysene	0.01
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.1
Benzo(a)pyrene	1
Dibenzo(ah)anthracene	1
Indeno(123cd)pyrene	0.1
Benzo(ghi)perylene	0.01

- [1] D. Arrouays, C. Jolivet, L. Boulonne, G. Bodineau, N.P.A. Saby, E. Grolleau, A New Initiative in France: A Multi-Institutional Soil Quality Monitoring Network, *Comptes Rendus l'Academie d'Agriculture Fr.* 88 (2002) 93–103.
- [2] I.C.T. Nisbet, P.K. LaGoy, Toxic equivalency factors (TEFs) for polycyclic aromatic hydrocarbons (PAHs), *Regul. Toxicol. Pharmacol.* 16 (1992) 290–300. [https://doi.org/10.1016/0273-2300\(92\)90009-X](https://doi.org/10.1016/0273-2300(92)90009-X).
- [3] INERIS, Portail Substances Chimiques, (2018).

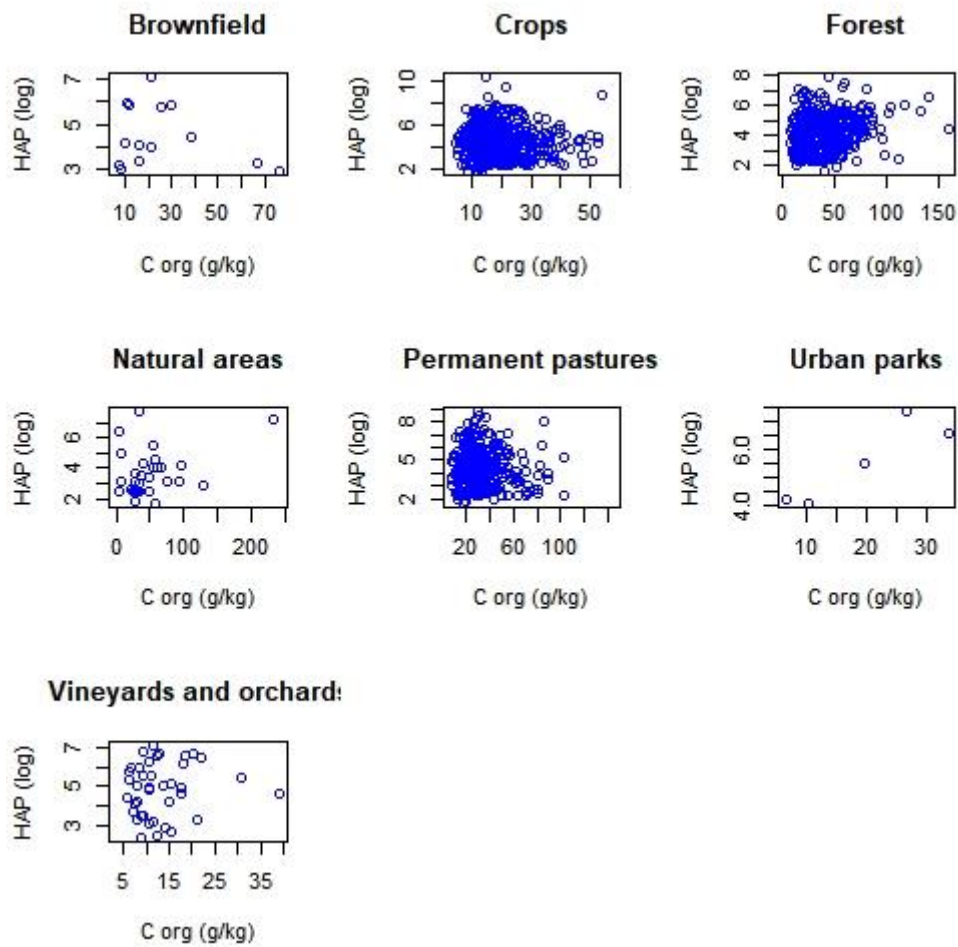


Figure S 2 Plots of total PAH content (in log) with organic carbon content in g/kg

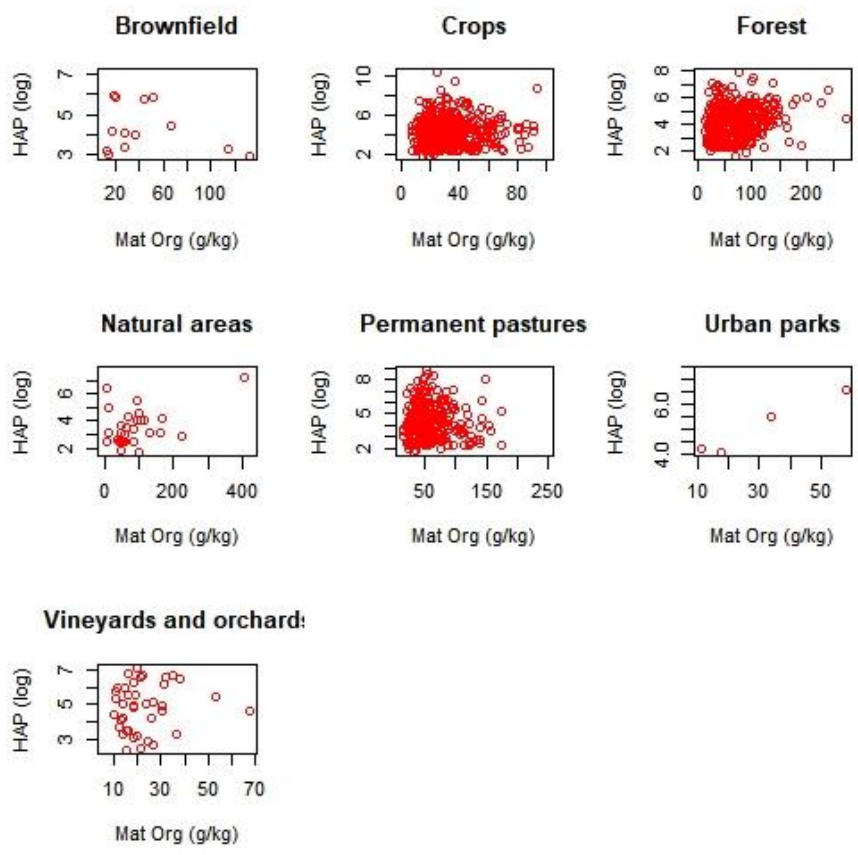


Figure S 3 Plots of PAH content (log) with organic matter (g/kg)

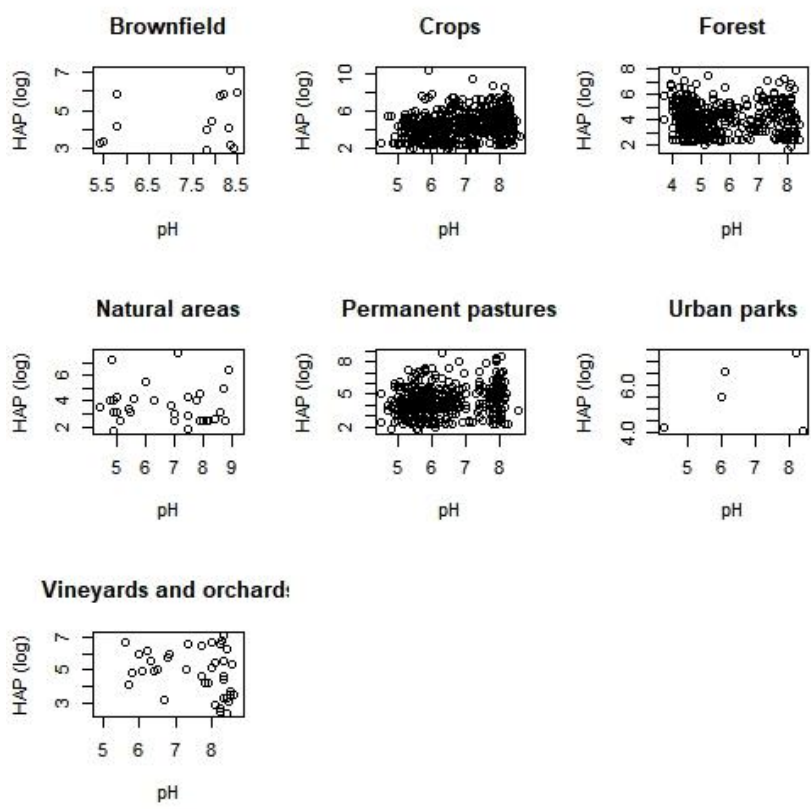


Figure S 4 Plots of PAH content (log) with pH

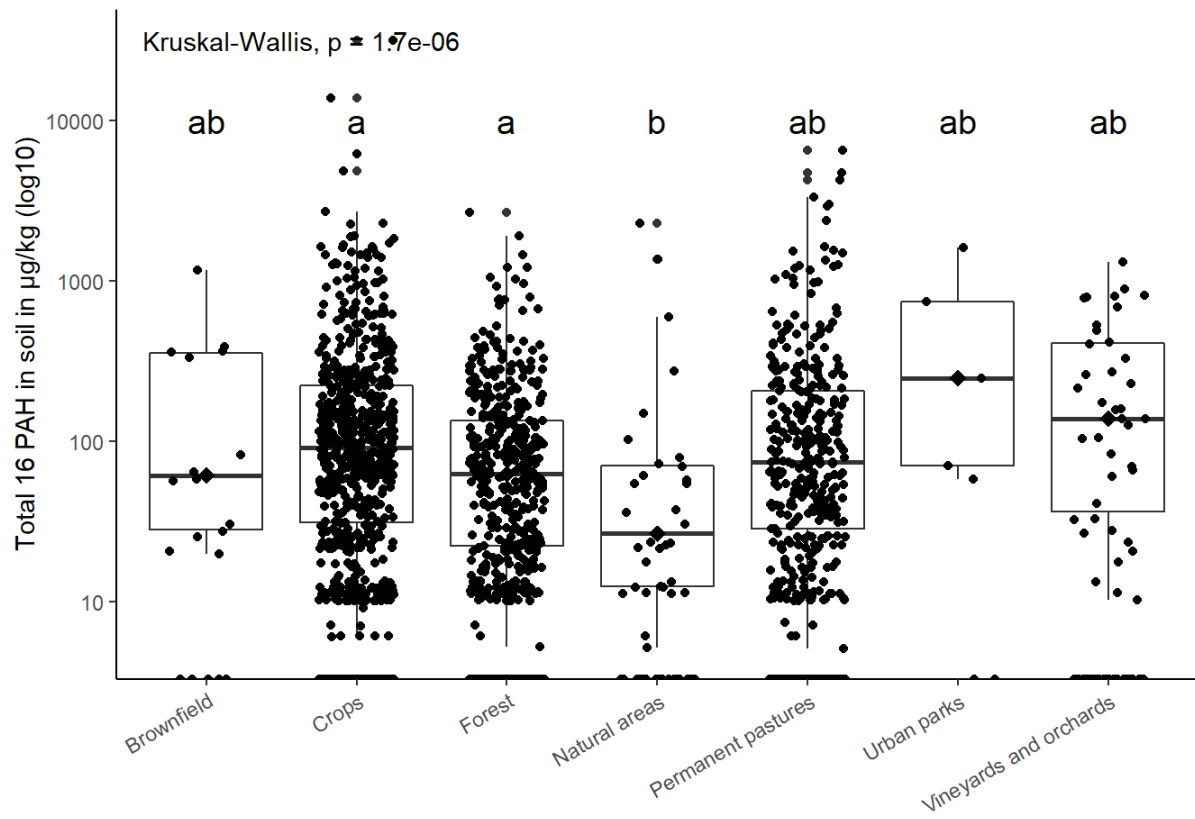


Figure S 5 Total PAH content displayed by landuse with kruskal-wallis test and attributed groups

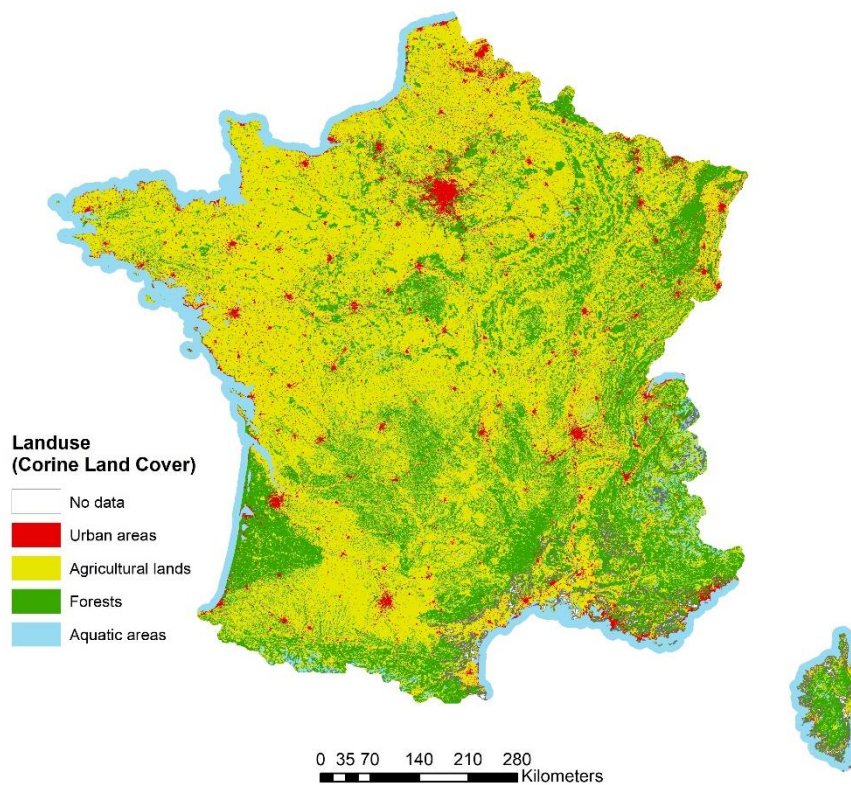


Figure S 6 Landuse of France based on Corine Land Cover (2006)