



The paradoxical pyrogenic carbon stocks and residence times in terrestrial and aquatic ecosystems

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Pyrogenic carbon (PyC) is the product of the incomplete combustion of biomass during wildfire or fossil fuels burning. It recently attracted special attention because it seems to be one of the most persistent organic compounds on earth. Moreover, it is ubiquitous in all the compartments of terrestrial and aquatic ecosystems. A series of recent studies tried to quantify PyC in soils, particulate and dissolved organic matter in rivers and oceans, as well as in sediments. We also know more about the residence time or the age of PyC in the different parts of the ecosystems. We find major consistencies across global ecosystems: PyC is one of the largest identifiable organic compound up to now and it is also one of the most persistent. However, we also observed large discrepancies between the pools. For example, the residence time of PyC in soil is much shorter than expected under natural conditions, and its decomposition patterns are not following the traditional climatic patterns as other type of organic matter does.. Also, globally, the age of river PyC in particulate organic matter is about 20 times higher than the soils. This indicates some specific pre-ageing mechanisms in the terrestrial systems before it joins the aquatic networks. Here, I will give an overview of these recent studies and present these apparent mismatches in our understanding of PyC cycling in the global C cycle.