# Controls on sedimentary plant wax lipid ages: a global perspective

STEPHANIE KUSCH[1]*

[1]Institute of Geology and Mineralogy, University of Cologne, 50674 Cologne, Germany
(*correspondence: stephanie.kusch@uni-koeln.de)

Terrestrial biomarkers such as vascular plant wax lipids and their isotopic composition are common tools used to reconstruct past environmental conditions. However, is has been shown that these biomarkers can be substantially pre-aged ($\Delta^{14}$C-depleted) upon deposition in aquatic sediments, at times impairing their use as paleoenvironmental proxies. The most $^{14}$C-depleted plant wax lipids in core-top sediments have been found in high latitude regions and their $^{14}$C-depletion translates into mean terrestrial residence times in excess of 10,000 years [1, 2].

Little is known about the factors controlling the mean terrestrial residence time of plant wax lipids. Studies on the local to regional scale indicate that the most important factors include temperature, precipitation, catchment size, relief, runoff, wetland coverage, permafrost coverage and thaw, and the contribution of kerogen-derived lipids [3, 4]. Yet, constraints as to which factor or combination of factors exert the major control on sedimentary plant wax lipid ages remain very limited, particulary on a global scale.

In this study, a global data set of previously published and new compound-specific $\Delta^{14}$C plant wax lipid data from aquatic core-top sediments is used to decipher the primary controls on sedimentary plant wax lipid ages. Samples span high to low latitudes, marine and lacustrine sediments, and coastal to offshore depositional settings allowing a comprehensive assessment of a wide range of geological, morphological, and climatic factors.

[1] Drenzek *et al.* (2007) *Mar. Chem.* **103**, 146-162. [2] Gustafsson *et al.* (2011) *Biogeosciences* **8**, 1737-1743. [3] Kusch *et al.* (2010) *GCA* **74**, 7031-7047. [4] Feng *et al.* (2013) *PNAS* **110**, 14168-14173.