# Organic proxies for palaeotemperature assessment: Prospects and problems

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In the last decade, our lab has developed three new methods for past temperature assessment of both marine and continental environments based on specific organic biomarkers. The $TEX_{86}$ palaeothermometer is based on membrane lipids (i.e. isoprenoidal tetraethers) of Thaumarchaeota residing in the water column of the ocean and lakes. Palaeothermometry based on the distribution of branched tetraethers, likely derived from the membrane lipids of bacteria, is currently widely applied in lakes, coastal marine sediments and loss deposits to reconstruct past continental temperatures. The distribution of long-chain diols, derived from eustigmatophyte algae, shows potential for reconstruction of past sea surface temperature, and, potentially, lake temperature. These three organic proxies have in common that there discovery was based upon observations from the field without a proper biological validation. In this overview presentation I will describe what it takes to fully develop a reliable proxy and discuss the potential limitations and prospects of these organic proxies.