It has long been hypothesized that hominin speciation, extinction and migration events are linked to changes in global or regional climate. Understanding connections between early hominin evolution and environmental variability is a subject of much interest and considerable debate with numerous hypotheses having been suggested. However, a current limitation is that many of the existing climate reconstructions are located far away from the places where our human ancestors lived. This talk will present results of a new organic geochemical study from paleolake Lorenyang, in the West Turkana Basin (Kenya), that spans the interval from 1.9 to 1.4 million years ago. During this time, *Homo rudolfensis* and *H. habilis* went extinct while *H. erectus* appeared. In this study, molecules (lipids) from bacteria and archaea are used to reconstruct past temperature while leaf wax isotopes are used to reconstruct past rainfall amount. This study is unique in that it provides a new climate reconstruction from location within a few kilometers of important hominin fossil and artefact sites.