



## **An isotopic comparison of cross-latitudinal horse hair data**

Elisabeth Thompson and Christopher Ramsey

University of Oxford, Research Laboratory for Archaeology, Oxford, United Kingdom (elisabeth.thompson@rlaha.ox.ac.uk)

This study explores whether the Rayleigh distillation process latitude effect, of depleted  $\delta^{18}\text{O}$  in precipitation toward the poles, can be observed in horse hair. This study specifically compares  $\delta^{18}\text{O}$  values in horse hair with meteorological variables, and examines whether regional changes in global climate can be observed. The sampling sites and the pony breeds used in this study will add to the increasing network of isotopic horse hair data and will create an even better understanding of the intra-species variation within the  $\delta^{18}\text{O}$  values of horse hair. By directly correlating the meteorological variables to  $\delta^{18}\text{O}$  variations, the effects of specific weather events at different latitudes can also be explored at a very high resolution.

24 horses were sampled within approximately 24 hours on the 7th March 2016 from Thordale Stud in Shetland; the Icelandic Food And Veterinary Authority in Iceland; the Exmoor Pony Centre in Exmoor; and the Pigeon House Equestrian Centre in Oxfordshire. Starting the sampling process from the most recent growth at the follicle, the sampling date becomes a chronological marker, temporally fixing the first sample within a sequential set of data points extending for one year or longer, depending on the length of each individual hair. Preliminary results confirm the hypothesis, demonstrating that a study of oxygen isotope ratios in horse hair from Oxfordshire to Iceland shows a latitudinal depletion gradient, consistent with a depletion of oxygen isotope ratios due to decreasing temperatures.