

1 **Supplementary Information**

2 **Figure captions**

3 **Figure S1** Chemical structures of all 15 brGDGTs (I-III) and crenarchaeol (IV) (De Jonge, et  
4 al., 2014). The compounds indicated with a prime symbol are referred to as the 6-methyl  
5 brGDGTs and the ones not designated by the prime symbol are referred to as the 5-methyl  
6 brGDGTs.

7 **Figure S2** Depth age models for each sediment core used in this study based on the  
8 information summarized in Table 2. To create consistent chronologies for the four sediment  
9 cores, the dates were calibrated into calendar ages using the CALIB 7.0, available at  
10 <http://radiocarbon.pa.qub.ac.uk/calib> (Stuiver et al., 1998). The calibration data and curve  
11 selection utilized for the three marine sediment cores was Marine13 and for the Tagus River  
12 Floodplain core IntCal13 was implemented (Reimer et al., 2013). All radiocarbon dates  
13 mentioned are expressed as calibrated ages (cal. BP) and have age spans in the  $2\sigma$  range.

14 **Figure S3** Averaged brGDGT distributions in soils of the Tagus River Basin are shown in  
15 panel a. Panels b-c show average brGDGT distributions for the Tagus soil samples based on  
16 altitude where Tagus soils sampled below 350 m (b) are considered low altitude and Tagus  
17 soils sampled above 350 m (c) are considered high altitude. Clearly the distribution of  
18 brGDGTs for low altitude samples is distinct from the distribution of brGDGTs for high  
19 altitude samples and the high altitude soil samples display a predominance of the 6-methyl  
20 over the 5-methyl brGDGT isomers. The colors of the bars reflect the brGDGT structure as  
21 labeled in the legend and the error bars represent 2xs the standard deviation.

22

Figure S1

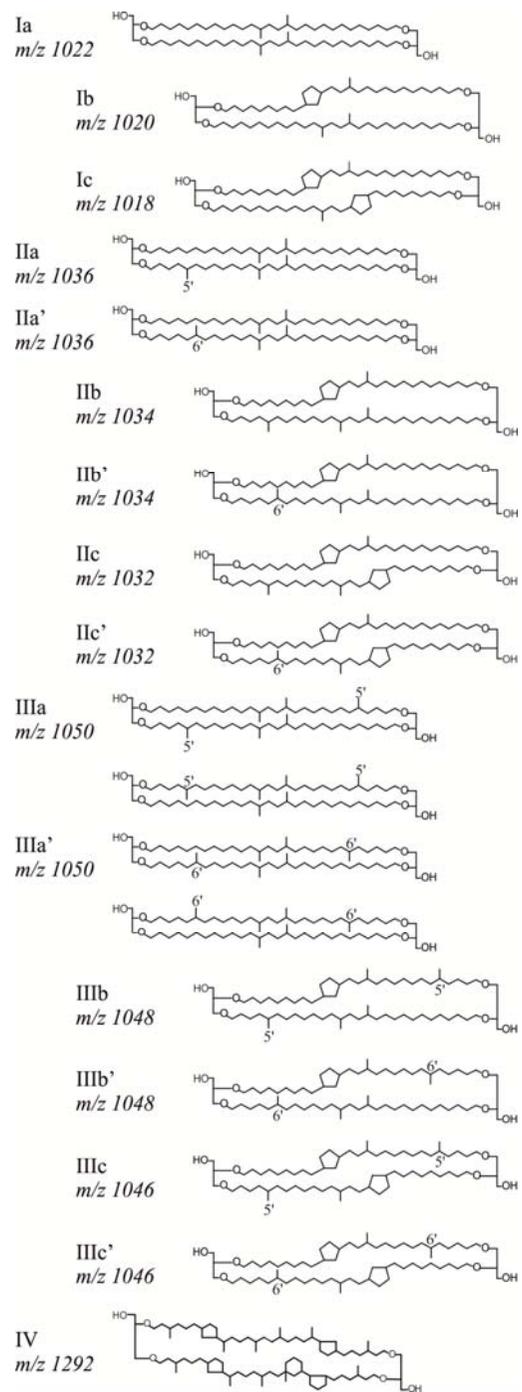
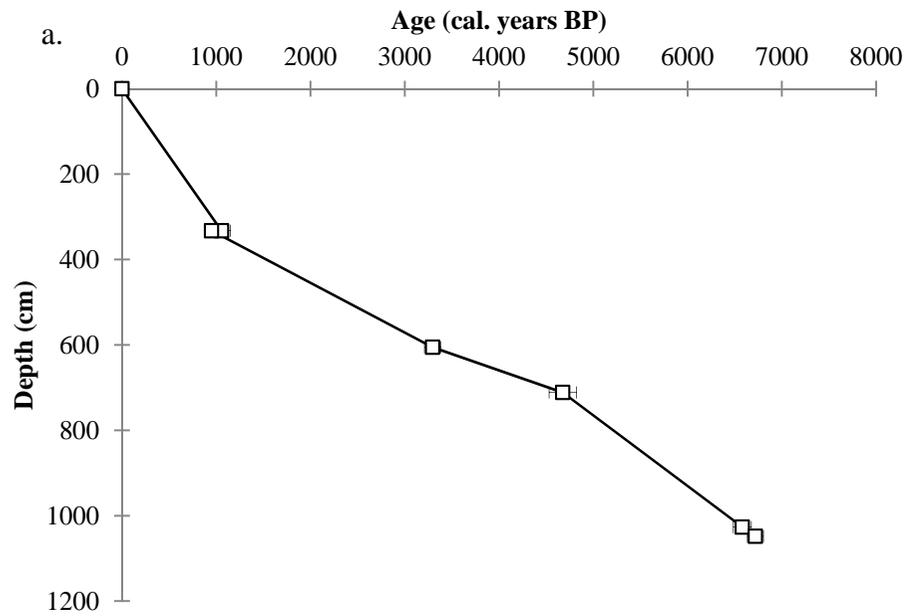
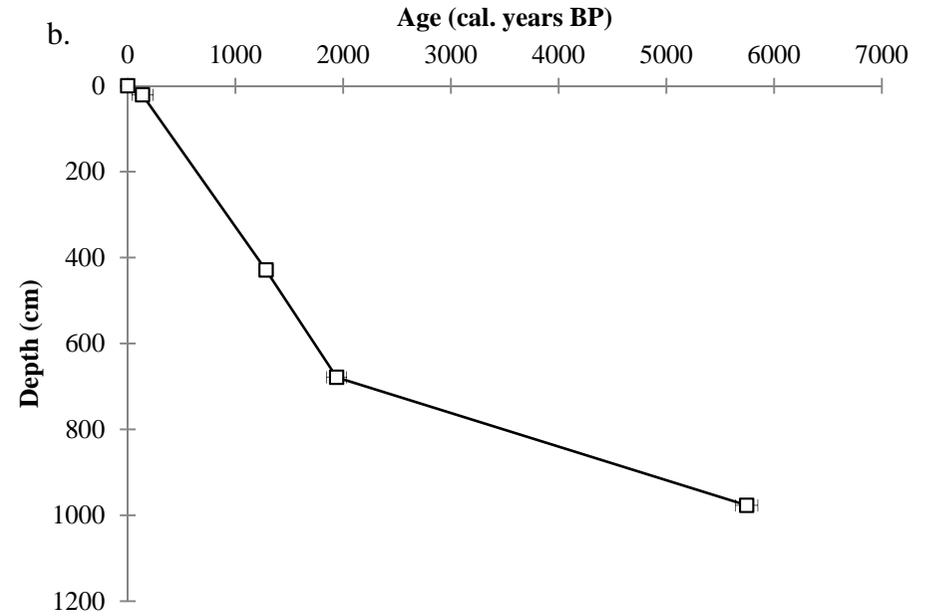


Figure S2

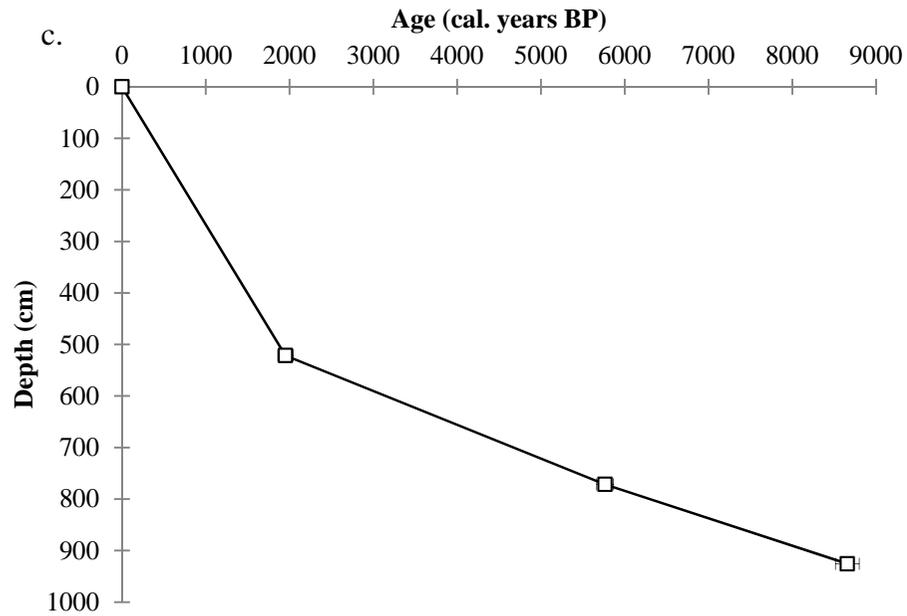
### Tagus River Floodplain



### Mudbelt



### Lisbon Canyon Head



### Lower Setúbal Canyon

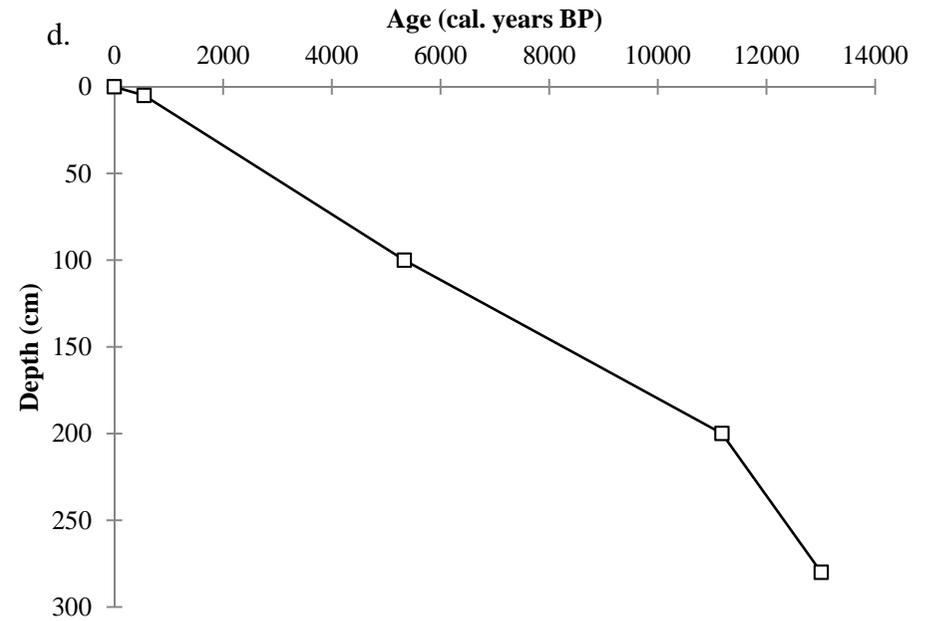


Figure S3

