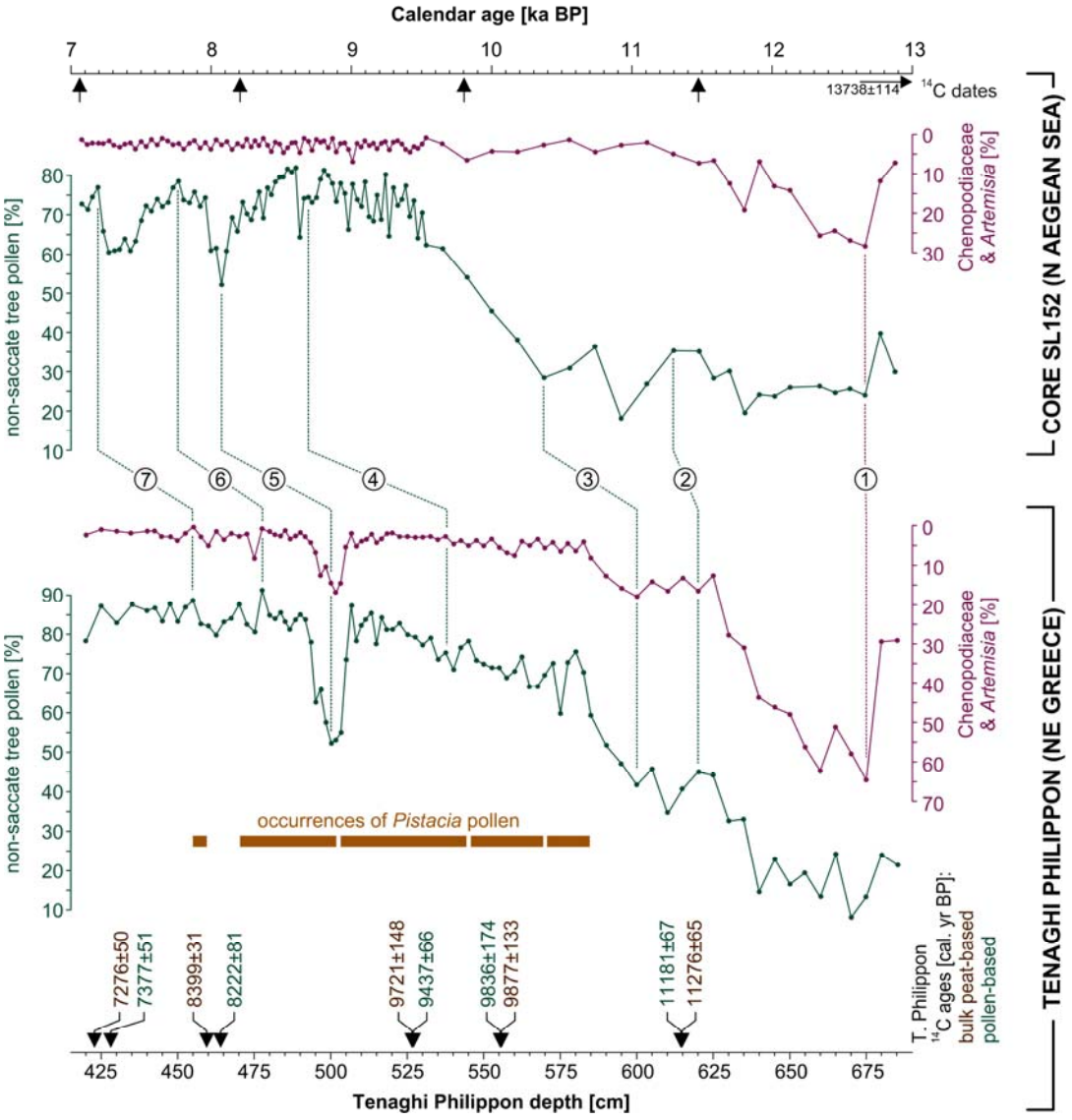

Figure DR1. Correlation of maxima and minima in the tree and herb pollen curves from Tenaghi Philippon with respective features in the pollen record from the marine core SL152 (northern Aegean Sea), which has a robust ^{14}C-based chronology (Kotthoff et al., 2008a, b). Tie points (1) to (7) are connected by dashed lines. Also shown are the occurrence of *Pistacia* pollen and the results of two different (i.e., bulk peat- and pollen-based) ^{14}C dating series for Tenaghi Philippon. Because *Pistacia* is biostratigraphically diagnostic for the Early Holocene in the Aegean region (Rossignol-Strick, 1995), its presence in the Tenaghi Philippon core corroborates an Early Holocene age of the respective interval. Although being too old due to hard-water effects and therefore not being used in the development of the age model shown in Figure DR2, the results from the bulk peat- and pollen-based ^{14}C dating series further support this age.

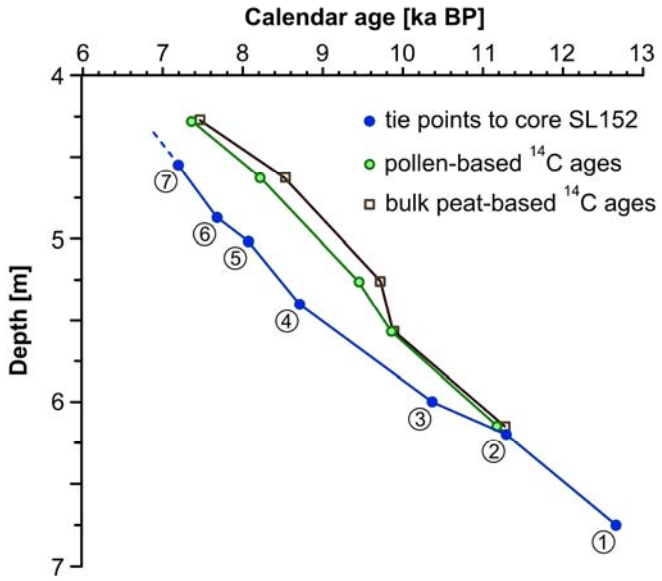

Figure DR2. Chronology of the Tenaghi Philippon core. The age-depth model used here (blue line) is based on the tie points (1) to (7) between the tree and herb pollen curves from Tenaghi Philippon and corresponding features in marine core SL152, northern Aegean Sea (Kotthoff et al., 2008a, b), as shown in Figure DR1. For the eastern Mediterranean region, such an approach has previously been proposed by Rossignol-Strick (1995). As recently demonstrated by Kotthoff et al. (2008a), core SL152 is well suited for a palynological land-sea correlation in the Aegean region. Also shown are the results of the ^{14}C dating series carried out on bulk peat (brown squares) and pollen (green circles; see Figure DR1 for ^{14}C ages). Both ^{14}C dating series are (to varying degrees, but in an internally consistent way) compromised by a hard-water effect and were therefore not incorporated in the age-depth model. The hard-water effect is strongest for the early Holocene, when it accounts for an age difference of up to ~1 ka (pollen-based dates) and ~1.2 ka (bulk peat-based dates) relative to the age model based on the palynological tuning to core SL152. The age-depth curve shows that the selected tie points yield highly consistent ages. Differences in sedimentation rates across the interval presented here are minor, thus justifying linear interpolation between the age control points.

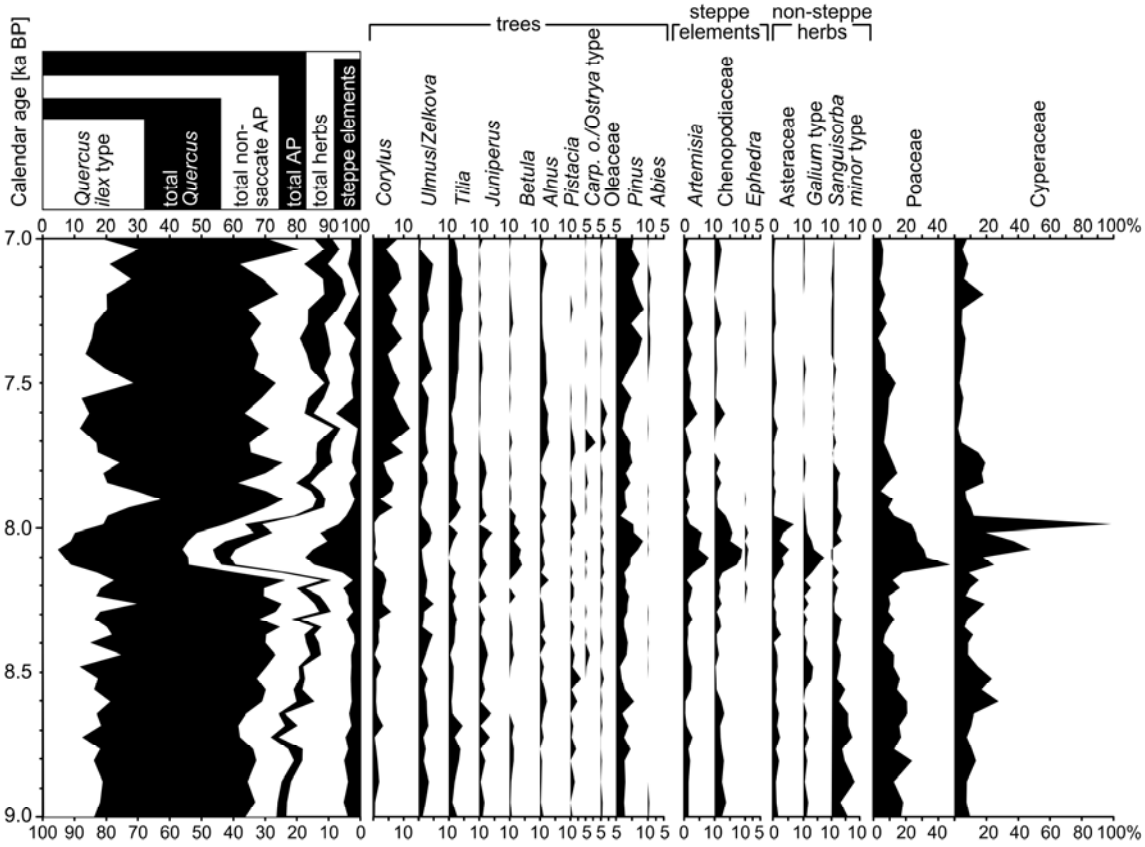

Figure DR3. Distribution of selected pollen taxa in the Tenaghi Philippon core. Steppe elements comprise *Ephedra*, *Artemisia* and Chenopodiaceae. *Artemisia*, *Centaurea* and Cichorioideae are excluded from the Asteraceae curve. Percentage values are based on the sum of tree, steppe-element and non-steppe herb pollen. Palynomorphs were counted to at least 250 identified arboreal pollen grains per sample. Pollen counts and a full taxon list are available through the Pangaea database (www.pangaea.de).

Methodology Of Quantitative Climate Reconstructions

Climate parameters were calculated from the pollen data using the Modern Analogue Technique (MAT) following Guiot (1990) and Peyron et al. (1998), and further constrained by the standardized biomization procedure of Guiot et al. (1993). Modern analogues are from the database used by Bordon et al. (2008), which comprises 3530 modern pollen spectra from Europe, Asia and northern Africa; more than 2000 of these pollen spectra are from the Mediterranean region. To obtain the climate estimates for a fossil assemblage, we used the climate parameters of the ten closest modern analogues, which were averaged by a weighting inverse to the chord distance. The climatic variability represented by these ten modern analogues is indicated by the most extreme positive and negative deviations in the

analogues in comparison to the mean value.

To increase the robustness of the MAT reconstructions, evergreen and deciduous *Quercus* were not differentiated in the evaluated pollen spectra and the modern analogues. This procedure makes our reconstructions independent from errors in the determination of the respective pollen taxa, which cannot always be unequivocally identified (see discussion in Kotthoff et al., 2008b). Moreover, Gramineae and Cyperaceae pollen were excluded from the modern-analogue database and the pollen spectra from Tenaghi Philippon prior to the MAT reconstructions. The underlying rationale is that these pollen can dominate pollen spectra from strongly different biomes, such as wetlands (where it represents a local-scale edaphic signal) and steppes (where it represents a regional-scale, continental climate signal). Consequently, their inclusion in the climatic evaluation of pollen assemblages from wetlands (as at Tenaghi Philippon) could lead to results that are biased towards continental climate conditions.

Supplementary Referenceson Quantitative Climate Reconstructions

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