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Spatial Structure of Eastern Mediterranean Tree-Ring Network

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Content :

Spatial modes of tree-growth in a newly developed network of 78 chronologies are summarized by S-mode principal components analysis (PCA), using varimax rotation of components. The network, representing eleven species and five countries, is intended for climatic reconstruction. Runs of PCA on two periods are described: 1) 1923-2000 CE (common period for all 78 chronologies), 2) 1251-2000 CE (time coverage by 6 chronologies). Unrotated and rotated PCA loadings are mapped to summarize modes of growth. Scree plots highlight the overwhelming importance of the first PC, presumably representing a broad regional climate signal. PC1 accounts for 29.3% of the tree-ring variance for 1923-2000 and for 49.2% of the variance for 1251-2000. The percentage of explained variance drops sharply after PC1 for both analysis periods. Maps of loadings suggest that both climate and species are important for the spatial structure of the chronologies.

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