based temperature reconstructions and solar activity, suggesting solar forcing as an important driving force for temperature variations during the last 750 years in this region.

There was general consensus on the high potential of the Altai region for multiproxy climate reconstructions. Suggestions for future work included extending the existing records further back in time, combining results from different proxies, and incorporating reconstructions from other archives, like archeological data (e.g., from Plateau Ukok), documentary data, phenological data from Katun National Park, and geomorphologic studies for reconstructing glacier history.

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References


Figure 2: Annual values (gray lines) and 100-year lowpass filtered (colored lines) temperature anomalies reconstructed from the Belukha ice core δ18O record (March-November T; red, Eichler et al., submitted), the Lake Teletskoye sediment geochemistry (annual T; green, Kalugin et al., 2007), and the tree ring width chronology for Larix sibirica at the upper timberline in the SE Altai (June-July T; blue; Ovtchinnikov et al., 2000). Periods of low solar activity are indicated by yellow bars (W = Wolf, S = Spörer, M = Maunder, D = Dalton and G = Gleissberg minima).

Climate extremes during recent millennia and their impact on Mediterranean societies

University of Athens, Greece, 13-16 September 2008

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The complexity of the Mediterranean climate makes the reconstruction of its past variability a challenging task. There is, therefore, a strong need for more high quality and high temporally resolved paleo-records from the region. Currently, spatial coverage is lopsided with little information available from northern Africa. The increase in research conducted on natural proxies in the Eastern Mediterranean, especially in Turkey, could help to compensate the scarcity of documentary records in that area. This interdisciplin ary Symposium aimed to bring together researchers from natural and human sci-
The impact of volcanoes on climate was addressed through both instrumental data and proxy reconstructions. Documentary sources can be used to describe volcanic effects on climate and society. Paintings created by artists, representing sunsets (measured red/green ratios) can provide proxy information on the aerosol optical depth following major volcanic eruptions. The seasonal impacts of tropical and extratropical volcanic eruptions over the last centuries on Mediterranean climate were also examined. Generally, GCM experiments support proxy reconstructions and seem logically consistent with the circulation reaction to the global re-distribution of heat following tropical eruptions.

The symposium ended with a session devoted to the impacts of climate extremes on Mediterranean societies. It covered the impacts of and adaptation to climatic events of the last millennia to today. In particular, the events of 8.2, 5.2, and 4.2 kyr BP were discussed. Such events had severe impacts on the Neolithic Mediterranean societies, including changes in mobility patterns and reduced demographic status due to reduced food supplies.

A discussion forum followed each session and culminating from these are several issues that were identified to improve research on past Mediterranean climate extremes:

- More high quality and high-resolution records - this task will take years to resolve, thus we suggest a “location sensitivity analysis” in conjunction with the climate system dynamical/modeling community to identify areas of particular sensitivity.
- Development of new proxies - currently employed proxies are of great use, however, we urge the development of new proxies, such as trace elements and fluid inclusion analysis of speleothems.
- Calibration of proxy data against instrumental data - it is vital that the calibration period be as long as possible. Initiatives towards this goal are being undertaken in the MEDARE project (www.mmm.urv.cat/MEDARE/index.html).
- Synthesis of these pre-existing records – this will aid understanding of the spatial distribution (especially inhomogeneities) and magnitude of abrupt climate events. Such data interchange will be enhanced by the MedCLIVAR metadata base (www.medclivar.eu).
- Integration and exchange between palaeo-researchers and dynamists/modelers - palaeo-scientists can provide results that serve to validate model results, or provide initial and/or boundary conditions for forcing models. In turn, dynamists/modelers can provide insight into understanding and interpreting the signals seen in paleorecords (see Fig. 1 as an example).
- Concentration on different time slices and/or scales – to provide information on the variability and contributions of different mechanisms at differing frequencies.

References