



Evaluating inner variability and common patterns of tree rings and pollen records in northern Italy: potentials for an integrated multi-proxy climate reconstruction

Valter Maggi (1), Giovanni Leonelli (1), Francesca Vallé (1), Roberta Pini (2), and Cesare Ravazzi (2)

(1) Dept. of Earth and Environmental Sciences, Università degli Studi di Milano-Bicocca, Milano, Italy (giovanni.leonelli@unimib.it), (2) IDPA-CNR Institute for the Dynamics of Environmental Processes, National Research Council, Milano, Italy

Multi-proxy approaches in past climate reconstructions need in the first steps a selection of appropriate climate-sensitive records and a deep evaluation of their inner variability. Moreover, as regards tree ring and pollen-stratigraphical records, they typically cover different time lengths and show different time resolutions. In order to assess the relationships between the variability of these two proxy records it is therefore necessary to restrict any comparison between the two proxies over a selected common period (usually the most recent) and to perform an adaptation of the annually-resolved resolution of the tree rings to the generally lower and variable resolution of the pollen records.

A first comparison between two summer temperature reconstructions derived from these two proxy records was performed in the central sector of the Italian Alps by selecting an area of approximately 150 km of diameter, comprising tree-ring series of European larch (*Larix decidua* Mill.), Norway spruce (*Picea abies* Karst.) and Swiss stone pine (*Pinus cembra* L.) from 42 sites located in five mountain groups - namely the Silvretta Group (Switzerland), the Ötztaler-Venoste Alps (Austria, Italy), the Bernina Group (Switzerland, Italy), the Ortles-Cevedale Group (Italy) and the Adamello-Presanella Group (Italy) and a pollen-stratigraphical record from the Lavarone Lake (Trento). Both the tree-ring (Leonelli et al., 2016) and the pollen-inferred reconstructions, were calibrated using the modelled site specific temperatures from an improved version of the dataset of Brunetti et al. (2006). The independently obtained summer temperature reconstructions, after adapting the tree-ring series to the time resolution of the pollen series, showed a good correlation over the common period 1803-2003, thus opening the possibility of performing integrated multi-proxy climate reconstructions including more sites from the whole arch of the Italian Alps.

Bibliographic references

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