



A 1600 year history of Alpine glacier equilibrium line altitude inferred from glacier length records, and the relation to summer temperature and radiation

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A new history of glacier equilibrium line altitude (ELA) for the time span 400-2010 is inferred from the combined interpretation of length change records of six glaciers from the Alps with help of a macroscopic model of glacier dynamics. This history is completely independent of proxy data from other sources. Comparison with proxy-based reconstructions of European summer temperature shows a generally good agreement, with the exception of a low-ELA (cold) period between 1300-1350, corresponding to rapid glacier advance, which is absent in the other records. Correlation of the glacier-derived record with total solar irradiance is high between 1800-1950, but deviates significantly from it after 1950.