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Enriching the historical meteorological information using newspaper reports

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The recent climatic changes and global warming require investigations of short- but also long -term changes of climate variability, especially the extreme meteorological events and their consequences. In Romania, the national weather network of the early 19^{th} century is relatively sparse with few completed datasets which restrict a comprehensive characterization of the climate that epoch. Information from natural archives include mainly tree-rings and lacustrine, fluvial archives which are relatively scarce with limited spatial and temporal resolution. In order to extend the availability of meteorological data across Romania and complement reconstructions based on natural archives we rely on information extracted from documents and journals, a valuable source of information still unexploited.

This study presents the results of a comprehensive screening of meteorological events including heavy rains, extreme temperatures, snow, storms, hail, thunder, lightning, floods, droughts reported in newspapers of the early 19^{th} century. These meteorological calamities are frequently reported in the daily newspapers and have a precise location and a daily, weekly to annual resolution. The findings were assembled in an open-access database including geospatial and temporal referenced data of the meteorological phenomenon and its consequences. The events were compared with instrumental data from the closest weather stations and other sources to cross-validate their accuracy and credibility. Our results show that newspapers are an invaluable source of historical meteorological information that can refine and reconstruct the early 19^{th} century climate over Romania.