



## **Weather extremes and the Romans - A marine palynological perspective on Italian temperature and precipitation between 200 BC and 500 AD**

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Sediments of a tephra-dated marine sediment core located at the distal part of the Po-river discharge plume (southern Italy) have been studied with a three annual resolution. Based on the variability in the dinoflagellate cyst content detailed reconstructions have been established of variability in precipitation related river discharge rates and local air temperature. Furthermore about the variability in distorted water quality has been reconstructed.

We show that both precipitation and temperature signals vary in tune with cyclic changes in solar insolation. On top of these cyclic changes, short term extremes in temperature and precipitation can be observed that can be interpreted to reflect periods of local weather extremes.

Comparison of our reconstructions with historical information suggest that times of high temperatures and maximal precipitation corresponds to the period of maximal expansion of the Roman Empire. We have strong indications that at this time discharge waters might have contained higher nutrient concentrations compared to previous and later time intervals suggesting anthropogenic influence of the water quality.

First pilot-results suggest that the decrease in temperature reconstructed just after the “Roman Optimum” corresponds to an increase in numbers of armed conflicts between the Roman and German cultures. Furthermore we observe a resemblance in timing of short-term intervals with cold weather spells during the early so called “Dark-Age-Period” to correspond to epidemic/pandemic events in Europe.