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Climatic context and meteorological anomalies during 1783 in Eastern Iberian Peninsula. Atmospheric processes and impacts of a singular "Bad Year"

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On the year 1783, the eruption of Laki volcano in Iceland produced strong anomalies in the atmosphere, including decreases in summer temperatures and vast socioeconomic impacts. However, the study of this event has been traditionally focused on central and northern Europe. Thus, the aim of this work is to analyze these anomalies in the Spanish Mediterranean area.

There are few studies in this area regarding climatic anomalies in historical times. Besides, research on potential factors producing an increase of climatic variability and meteorological extremes is interesting. Here, we first explore the anomalies on precipitation patterns due to their complex impact on water resources and flood consequences.

In addition, for a better understanding of this period, we follow a multi proxy-data approach, including dendroclimatic data to provide a climatic context, and documentary sources to explain socioeconomic impacts and extreme hydrological derived dynamics. More precisely, we use the rogation ceremonies, with which we infer dry or rainy periods, and administrative sources to identify flood damages, agricultural impacts, or management of water resources. Private sources (diaries, chronicles) inform about thermal anomalies and other singular circumstances related to special atmospheric conditions during and after the eruption. Information about indirect impacts are also analyzed in the long term. For example, malaria epidemics between 1783-1786, with 100,000 deads in the Spanish Kingdom.

Finally, we also analyze instrumental data, including different barometric indices and synoptic reconstructions using SLP data, which help identifying the atmospheric processes producing meteorological anomalies described by proxy-data.