Statistical characterization of extreme rainfall climate along the future high-speed rail track in Portugal.

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The characterization of rainfall and its extremes at different spatial and temporal scales
is important for the evaluation of environmental risks along high-speed rail systems.
Rainfall can induce accidents for example through the activation of landslides and
affects operations by causing slowdown. We present an exploratory analysis of point
rainfall data from mainland Portugal, distributed over an area of approximately 30
km by 460 km. This corridor includes the high-speed rail track that is now being
designed for Portugal. This is the first step in the assessment of hydrologic risk for
this infrastructure.

The dataset includes rainfall time series with heterogeneous length and resolution:
some of the data are from tipping bucket rain gauges with hourly resolution and an av-
erage length of 5 years, while others are from conventional gauges with daily data over
periods of more than 50 years. Key statistical characteristics of the rainfall process, in-
cluding extremes, are investigated to increase our understanding of the variability of
the rainfall climate along the rail track. Maps showing the areal distribution of statis-
tical characteristics of the process are drawn to better illustrate the spatial variability
of the rainfall threat in the study area.