



## **Magnitude and impacts of flash floods around the Mediterranean Sea**

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Our knowledge of floods in the Mediterranean area has advanced substantially in recent years thanks to the development of databases and focused research programs. A general pattern of the spatial and seasonal distribution of flood magnitudes can now be established. The main characteristics of the floods around the Mediterranean Sea are the following:

1. The magnitude and impact of extreme floods vary significantly over the Mediterranean region with a clear contrast between west and east. The western part of the area is much more exposed to high impact and high magnitude events. This is probably due to the proximity of the Atlantic Ocean and oceanic climatic influences at latitudes where eastward atmospheric flows dominate.
2. Some sub-regions, including Liguria and Piedmont in Italy, Cévennes-Vivarais-Roussillon in France, and Catalonia and the Valencian province in Spain are particularly exposed to extremely severe floods whose peak discharge values may be close to world records. This particular pattern is the result of the interplay between the dominant atmospheric low level northward flow circulation patterns and the relief and orientations of the northern Mediterranean coast, which force convergence and trigger convection.
3. Fall is clearly the main season - but not the only season - for extreme and damaging floods. This is particularly the case of mesoscale convective systems producing long lasting and stationary rainfall events that lead to strong responses of the affected watersheds (i.e. high runoff rates due to soil and subsoil saturation) and to extraordinary peak discharge values.
4. No significant trend is detected in the frequency and magnitude of extreme floods in the Mediterranean region to date, probably due to the limitations of the available datasets and some complex overlapping signals (e.g. decadal and inter-decadal variability). Likewise, the existing projections do not clearly point to a change in extreme flood patterns in the Mediterranean region linked to climate change. But, whatever the case may be, the risk of flooding is likely to increase due to population growth and urban development in flood prone areas in the coming years.