



## Shifts in the Timing of European Floods

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The magnitude and timing of river floods is expected to change in a warmer climate. To elucidate the existence of such changes at continental scale, the timing of river floods in Europe is investigated over the period 1960-2010 using a pan-European database from over 4000 hydrometric stations.

Coherent spatial patterns of mean timing of annual maxima are found across the continent.

More important, distinct regions with shifts towards earlier or later flood timing are apparent, highlighting the existence of a clear change signal in flood observations at the continental scale.

Warmer temperatures have led to earlier snowmelt floods during late winter or early spring throughout northeastern Europe; later winter floods can be found around the North Sea and some sectors of the Mediterranean coast; and earlier soil moisture maxima have led to earlier winter floods in western Europe.

Identification of the change signals in flood timing together with the controls allows for a better overall physical understanding of changes in flood attributes already observed or expected in a changing climate.

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