

Droughts, not floods, are the biggest challenge in the Alps

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Global warming will have much more impact on droughts than on floods in the Alps. Simulated changes in flood magnitude are negligible whereas droughts will become more intense and last longer.

Projections

Climate change will have a much stronger effect on droughts than on floods in the Alps, scientists concluded in a recent study. They simulated discharge characteristics for 925 catchments in the Alps under future global warming levels of 1°C, 2°C, and 3°C. According to their results, river floods in the Alps will not change significantly in magnitude and will not last longer. The only change in floods they observed in their results is a change in seasonality: the timing of floods is expected to shift toward earlier in the year with increasing temperatures.

Future droughts, on the other hand, are projected to become more intense, develop larger deficits, last longer, and become slightly more widespread with increasing temperatures.

Agreement with observations

These future projections of changes in floods and droughts align well with observations in the past. Observations so far do not show clear changes in flood magnitude but do show earlier flood occurrences over the last decades because of an earlier start of spring snowmelt season. Droughts have become more intense because of decreased snowmelt and precipitation and increased evapotranspiration. In addition, these findings agree with the projections of other studies that show clear increases in streamflow drought deficits and intensities for the future for Central Europe and the Alps.

Source: Brunner and Gilleland, 2024. Earth's Future 12.