

Experts: Expect worsening flooding and drought as rapid warming continues

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The UK and the rest of the world will be vulnerable to larger swings between flooding and droughts as global temperatures rise, a new study

has found.

Climate change is intensifying the world's water cycle (the flows of water through the Earth's atmosphere, across the surface and underground) leading to more extreme wet and dry periods, according to findings published this week in *Environmental Research Letters*.

Richard Allan, Professor of Climate Science at the University of Reading, the study author, used real-world data since 1950 measuring rainfall and evaporation and compared this with sophisticated computer simulations used to predict future climate changes up to 2100.

Professor Allan said, "If the world continues its current rate of warming, the difference between precipitation and evaporation at the wettest and driest times of the year will increase by 20 percent in some regions by the end of this century. This increasing contrast can lead to severe consequences, such as more intense flooding during wet periods and more rapidly developing droughts as dry spells take hold."

"It may seem strange that we could get more extreme dry and wet spells as the climate warms, but this is possible because a warmer atmosphere is a thirstier atmosphere—it can more effectively sap the soil of its moisture in one region and dump this extra water as [heavy rainfall](#) in storms and monsoons, increasing the contrast in weather between regions and between different times of the year."

"As our [greenhouse gas emissions](#) continue to heat the planet, there will be greater swings between drought and deluge conditions that will become more severe over time. We have already seen [severe flooding](#) in Japan, China, South Korea and India this year, which has caused deaths, damage and power cuts."

"It is only with rapid and massive cuts in greenhouse gas emissions that

we can limit warming and the increasing severity of wet and dry spells. Understanding these changes is vital for planning and managing our [water resources](#), as well as improving predictions of how the [water cycle](#) will evolve in a warming world."

Rapid swings between drought and severe flooding are known to be particularly difficult for countries to deal with. Recent research [published in *Advances in Atmospheric Sciences*](#) by Professor Emily Black , also at the University of Reading, has shown that the frequency of "flash" droughts are projected to more than double in many regions over the 21st century.

These types of rapidly developing droughts can damage crops and will likely become more frequent in parts of the world including South America, Europe, and southern Africa.

More information: Richard P Allan, Amplified seasonal range in precipitation minus evaporation, *Environmental Research Letters* (2023). [DOI: 10.1088/1748-9326/acea36](https://doi.org/10.1088/1748-9326/acea36)

Provided by University of Reading

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