**RRES Press Release 24th March 2025** [**Climate patterns and water quality linked in farming landscapes**](https://www.rothamsted.ac.uk/news/climate-patterns-and-water-quality-linked-farming-landscapes)

**New research highlights climate influence on soil erosion in Southwest England**

A recent study conducted in southwest England has shed light on the connection between large-scale climate drivers and suspended sediment concentrations, a key factor in water quality. The research, focused on the impact of changing weather patterns on soil erosion, suggests that climate indices could be used to help land managers plan how to best handle sedimentation risk in local water courses.

Soil erosion and sediment delivery are growing concerns for water quality across western Europe, with increasing pressures from agriculture and climate change. While previous studies have explored the effects of broad climate systems such as the North Atlantic Oscillation (NAOi) on weather patterns, a new index—the West Europe Pressure Anomaly (WEPAi), based on the atmospheric pressure difference between the Canary Islands and Ireland —has been proposed as more directly relevant to the region, particularly in northwestern Europe.

Using long-term data from meteorological records, climate indices, and detailed discharge and turbidity measurements, the research team explored the relationship between these climate drivers and suspended sediment concentrations over a four-year period. They found that in winter months, there were significant positive relationships between sediment levels and the WEPAi index, but not with the NAOi. Interestingly, no such patterns were observed in the summer, and the NAOi was not linked to sediment responses at any spatial scale explored in the study.

The findings point to the potential of WEPAi in explaining periods of high sediment loss, allowing farmers and land managers to better understand how their activities run the risk of elevated pollution. However, the study emphasizes that more research is needed across different landscape types to confirm whether these results hold true in a broader context.

Our research highlights the growing importance of understanding climate’s role in elevating soil erosion, sediment loss and water quality degradation,” said Prof. Adie Collins who led the study. “Hopefully these insights can help improve risk planning.”

**Publication**

S J Granger, H R Upadhayay, B Castelle and A L Collins (2025) The influence of large-scale climate patterns on sediment loss from agricultural land—exploration using an instrumented field and catchment scale platform [Environmental Research Letters](https://iopscience.iop.org/journal/1748-9326), [Volume 20](https://iopscience.iop.org/volume/1748-9326/20), [Number 4](https://iopscience.iop.org/issue/1748-9326/20/4) 044023https://doi.org/10.1088/1748-9326/adbd55

Contacts Prod Adie Collins, Dr Steve Granger, Dr Hari Ram Upadhayay