Department for Education

Research and analysis

Summary of findings in relation to 3 climate risks: overheating, flooding and water scarcity

Published 19 June 2025

Applies to England

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Overheating

When classrooms get too hot, it can make it harder for students to learn. The UK climate change risk assessment high temperatures briefing states that high temperatures can be one of the key factors affecting the concentration of children in schools.

A collaboration between the Met Office and University College London (UCL) has provided some initial insight, modelled at estate level, to raise awareness in the education system of how the predicted rise in temperatures could impact education.

Findings from the collaboration show the extent to which rising temperatures – from subtle general increases to extreme heat events (heatwaves) – could affect students' ability to learn.

Overheating risk assessment for extreme heat events

On very hot days, particularly when indoor temperatures reach 35°C, learning could become very difficult. On average, some schools may already experience one or two days a year like this.

It's been predicted that global surface temperatures could rise to approximately 4°C above pre-industrial levels by the turn of the century, if no global climate action is taken.

If no adaptation measures are implemented for educational settings in advance of this, it's predicted that learning could not reasonably take place in some teaching spaces across the education estate on up to 8 days a year due to extreme heat events.

Based on the Met Office and UCL analysis, Table 1 sets out the estimated average number of days a year that indoor temperatures have been predicted to reach or exceed 35°C in some schools due to extreme heat events.

Three future climate change scenarios have been used. The number of extreme heat days that could be experienced has been estimated.

The scenarios are based on the predicted increase in global surface temperature above the 1850 to 1900 average if actions to mitigate climate change are not taken.

More information about climate change scenarios, is available on the Met Office website.

For full details on the underlying methodology, read Quantifying overheating risk in English schools: a spatially coherent climate risk assessment.

Table 1: Extreme heat days estimate

Scenario	Increase in global surface temperature since 1850 to 1900 levels	Predicted date of increase if no global climate action is taken	Average number of extreme heat days per year
Baseline	+1.2°C	Current	1.7
1	+2°C	2050	2.9
2	+4°C	2100	7.8

Overheating risk assessment for generally warmer temperatures

Even when temperatures are less extreme, persistent increases in temperature can affect the ability to learn.

Three future climate change scenarios have been used. The number of extreme heat days that could be experienced has been estimated.

The scenarios are based on the predicted increase in global surface temperature above the 1850 to 1900 average if actions to mitigate climate change are not taken.

Based on the Met Office and UCL analysis, Table 2 sets out the estimated equivalent number of learning days that could be lost by pupils in some schools due to more subtle increases in temperature resulting in a decreased ability to learn over the course of a typical academic year.

In the longer term, without the implementation of any adaptation measures, students could potentially lose up to 12 days of learning per year on average, as result of generally warmer temperatures and not just from extreme heat.

It’s important to recognise that these are averages based on emerging evidence, giving only an indicative indication at this stage.

Table 2: Generally warmer temperatures estimate

Scenario	Increase in global surface temperature since 1850 to 1990 levels	Predicted date of increase if no global climate action is taken	Estimated learning days lost
Baseline	+1.2°C	Current	6.7
1	+2°C	2050	8.2
2	+4°C	2100	11.4

Flooding

Flooding is another climate risk. Many schools, especially secondary settings, are at risk from surface water and river and sea flooding, affecting:

- buildings
- playgrounds
- access routes

Based on information provided by the Environment Agency (EA), the proportion of state-funded schools at risk from surface water and river and sea flooding has been assessed.

The assessment uses the EA categories of risk, based on the likelihood of a flood event occurring. These are:

- high – greater than or equal to 3.3% (1 in 30) chance in any given year
- medium – greater than or equal to 1% (1 in 100) chance in any given year
- low – greater than or equal to 0.1% (1 in 1,000) chance in any given year
- no risk – less than 0.1% (1 in 1,000) chance in any given year

Buildings with a footprint of greater than 25 square metres, and associated sites – for example, playing fields and car parks – have been assessed separately. It is not necessarily the case that if the site is at risk, the building will also be at risk.

Based on the analysed EA information, Table 3 sets out the estimated proportion of schools at risk from surface water flooding.

Table 4 sets out the estimated proportion of schools at risk from river and sea flooding.

Some totals in Tables 3 and 4 may not match due to rounding of numbers.

Table 3: Surface water flooding estimate

Education phase	Location	Low risk	Medium risk	High risk	Not at risk
Primary	Building	66%	37%	20%	34%
Primary	Site	80%	53%	33%	20%
Secondary	Building	83%	59%	38%	17%
Secondary	Site	89%	76%	59%	11%

Table 4: River and sea flooding estimate

Education phase	Location	Low risk	Medium risk	High risk	Not at risk
Primary	Building	7%	4%	1%	93%
Primary	Site	10%	7%	3%	90%
Secondary	Building	7%	4%	1%	93%
Secondary	Site	13%	10%	6%	87%

Water scarcity

Water shortages in schools, while uncommon, do occur and we know that when individual schools are affected it can be highly disruptive. The Department for Environment, Food and Rural Affairs makes the Department for Education (DfE) aware of issues reported and DfE monitors these accordingly.

We publish non-statutory emergency planning guidance to aid settings in planning for a range of emergency scenarios.

We remain alert to emerging knowledge of climate risks to education and will update our assessments and guidance as new information comes to light.

Current DfE initiatives

In response to the climate risks of overheating, flooding and water scarcity, DfE is actively implementing a range of initiatives such as:

- embedding adaptation into capital programmes – all new school buildings delivered through the school rebuilding programme are designed to be climate resilient
- evidence-building for future funding – desktop assessment and pilot evaluations are helping to quantify need, prioritise interventions and manage investment strategically
- investing in flood resilience through the schools water strategy, and testing scalable solutions through the Bradford resilient schools pathfinder projects to support the case for future funding

What schools and trusts can do

Schools and trusts should familiarise themselves with the guidance on extreme weather events and on supporting vulnerable people. It includes:

- hot weather and heatwaves
- assess and manage flood risk in schools checklist
- looking after children and those in early years settings before and during hot weather

- supporting vulnerable people

Schools and trusts should also:

- put in place a climate action plan
- nominate a sustainability lead

Doing this will help your school or trust understand your specific situation. You will then be able to implement bespoke adaptations to suit your setting.

There is a range of support available to help you with this, including:

- Sustainability Support for Education
- Climate Ambassadors
- National Education Nature Park

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