

## INTRODUCTION

Cinderford is a small town in the Forest of Dean, Gloucestershire, with a population of around 11,000 people (ONS, 2021).

Cinderford's population resides mostly in urban areas.

Its economy centres on healthcare, construction, retail and education.



To help quantify the level of climate risks for Cinderford, this climate risk summary uses the 2018 UK Climate Projections (**UKCP18**) to provide an up-to-date assessment of how the climate is expected to change in the future. Across the UK, and in Cinderford the UK climate projects predict:

- Increased chance of **warmer, wetter winters** and **hotter, drier summers**.
- Likely increases in the intensity of short-period rainfall events, and increases in flood risk in all seasons.
- Record breaking hot summers and drought conditions are expected to become more common.

## PRIORITY CHALLENGES FOR CINDERFORD

Specific impacts of climate change for Cinderford are likely to include:

### HEALTH

Increased risk to vulnerable groups and ageing populations health from heat stress.



### HEAT

Increased energy demand for summer cooling which could raise energy bills during the hottest months of the year.



### HEAVY RAINFALL

Increased risk of river and surface water flooding from heavy rainfall events.



### DRAINAGE

Increasing issues for urban drainage system causing disruption for urban areas of Cinderford.



### INTERNATIONAL RISK

Global Impacts may cause disruption to food supply chains, with potential to cause local price rises and supply shortages.



### SUBSIDENCE

Longer, drier summers and more frequent heat in the future could lead to an increase in subsidence to buildings.

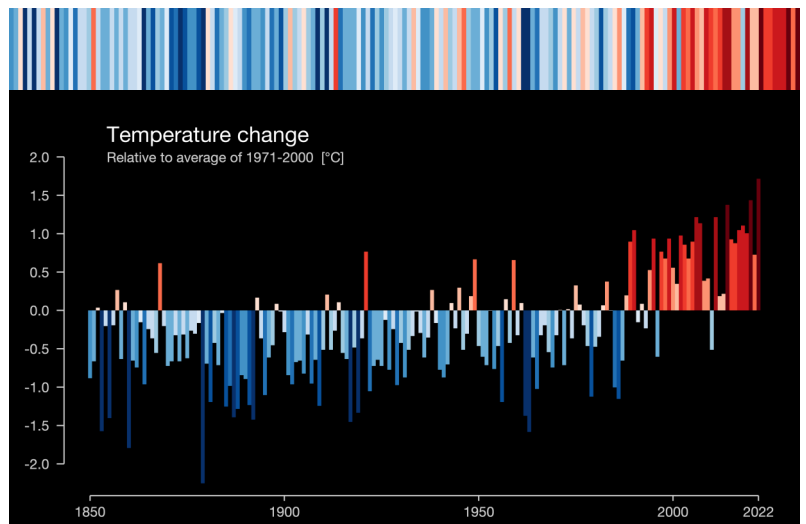


## HISTORICAL TREND

### How has Cinderford's Climate Changed?

The stripes show how temperatures local to Cinderford have changed from 1884 to 2022, with many of the hottest years occurring in the last

Temperature Difference (°C) Data: Had UK-Grid Concept: Ed Hawkins



## How are climate change values determined?

This risk summary uses the latest Met Office UK Climate Projections (UKCP). More detail can be found on these here ([UKCP18 Science report](#)).

To show the amount of change for your location, we are presenting this in the form of a 'middle ground' estimate (the median climate change projection). The amount of change could be higher or lower than this, however.

We also show climate change estimates depending on two greenhouse gas emission scenarios: medium and high.

## How might greenhouse gases affect the climate change estimates?

Our future climate is determined by ongoing and future greenhouse gas emissions, which are uncertain.

We have looked at two possible greenhouse gas emission scenarios – i.e. two possible climate futures. These align with those recommended by Climate Leadership Gloucestershire.

### Medium - Global emissions are mitigated to varying levels.

- Under a medium emission scenario we would expect to reach a global temperature rise of between 2°C and 3°C.

### High - Global emissions grow unmitigated.

- Under a high emission scenario we could reach 4.3°C global temperature rise by 2100.



## HEADLINE UKCP18 RESULTS FOR CINDERFORD

### RAINFALL

Winter rainfall increase is likely to lead increased river flooding. Summer/autumn rainfall is likely to increase surface water flood risk.



Drought conditions are also likely to increase, especially in summer.

### COLD WEATHER

Cold weather is likely to decrease. Warming will increase average temperatures during winter months.



Despite a warmer winter trend, extreme cold/snow events are still possible.

### HOT WEATHER

Hot weather is likely to increase.



There are implications for buildings (cooling and insulation) and human health.

### HEATWAVE EVENTS

Heatwaves are likely to become more common.



In the future there are likely to be two to four times more heatwaves per year.

# CINDERFORD: SECTOR CLIMATE RISK INDICATORS

The climate risk indicators below demonstrate potential climatic changes relevant to Cinderford.

**Road melt risk**  
Days with Tmax above 25°C

	2050	2070	2100
Medium	25	35	42
High	35	57	70

Local road users, during summer, will increasingly experience road melt disruption under both scenarios.

**Heat Stress**  
Days with shade Wet Bulb Globe Temperature (WBGT) above 25

	2050	2070	2100
Medium	0.5	1.1	1.9
High	1.3	4.6	8.1

Heat stress days will increase for both scenarios, causing issues for Cinderford's vulnerable populations.

**Wildfire - Fire Danger (Very High)**  
Days with the Met Office's Fire Severity Index (FSI) above specific thresholds

	2050	2070	2100
Medium	36	47	54
High	45	65	75

Under both scenarios, the local area will be increasingly at risk from wildfire of 'very high' severity.

**Growing Season length**  
Length between start and end of growing season (Days)

	2050	2070	2100
Medium	272	281	284
High	281	297	303

Local growing season length under both scenarios will increase, causing variability for crop growth and yields.

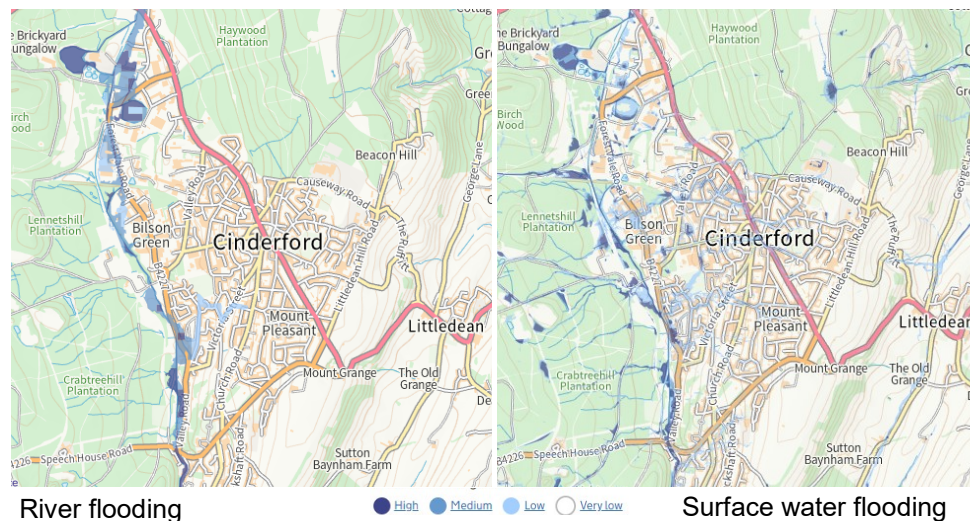
The above indicators were developed during the [UK Climate Resilience Programme](#) - funded by UK Research and Innovation and the Met Office (2023)

## CURRENT AND FUTURE FLOODING

Some areas and locations in Cinderford are currently at risk from river and surface water flooding.

Environment Agency flood mapping (right) details key areas of current river (left) and surface water flooding (right) in Cinderford.

Extreme weather events, such as flooding are likely to occur more frequently in the future.



The Environment Agency's website\*, show increases of between 20% and 40% in rainfall intensity in the 2050s to 2070s and from approximately 20% to 95% in river flood flows in the 2050s to 2080s.

The ranges of change depend on the future time period and the relative magnitude of the flood event. The range also encompasses uncertainty in the projections from the climate models.

Higher increase values are less likely but plausible, and can be used for precautionary purposes.

\*<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

## APPENDIX: FULL UKCP18 RESULTS

In recognition of Climate Leadership Gloucestershire's adoption of the Climate Change Committees principles for good adaptation policy, we have included headline projections to help Cinderford Adapt to 2°C and assess the risks up to 4°C of warming.

<b>Medium emissions scenario</b>	2050s	2070s	2100
Annual Average temperature (°C change)	+1.3	+1.9	+2.3
Average Summer temperature (°C change)	+1.7	+2.7	+3.2
Average Winter temperature (°C change)	+1.1	+1.5	+1.7
Summer Rainfall (% change)	-14.3	-20.7	-24.1
Winter Rainfall (% change)	+7.9	+12.6	+15.1
Heatwave events (Events/year)	1.4	2.2	2.9
<b>High emissions scenario</b>			
Annual Average temperature (°C change)	+2.0	+3.1	+3.8
Average Summer temperature (°C change)	+2.6	+4.3	+5.2
Average Winter temperature (°C change)	+1.6	+2.5	+2.9
Summer Rainfall (% change)	-19.7	-29.7	-35.9
Winter Rainfall (% change)	+11.9	+20.1	+24.7
Heatwave events (Events/year)	2.3	3.7	4.1

*Median values are given for projection results. Results are calculated as change from the baseline period: 1981-2000.*

## TERMINOLOGY

<b>Adaptation</b>	In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities.
<b>Fluvial flooding</b>	Fluvial flooding occurs when rivers and streams break their banks and water flows out onto the adjacent low-lying areas.
<b>'Locked in' Climate Change</b>	The Intergovernmental Panel on Climate Change (IPCC) has warned that even if effective mitigation for 1.5°C was put in place, damages stemming from climate change are not preventable, as there is a "locked-in" level of warming that is already causing unavoidable consequences.
<b>Mitigation</b>	A human intervention to reduce emissions or enhance the sinks of greenhouse gases.
<b>Scenario</b>	A projection of future emissions, either following assumed future emissions or consistent with a specific increase in global average temperature.
<b>UKCP18</b>	UK Climate Projections 2018