

INTRODUCTION

Lydney is a small town in the Forest of Dean, Gloucestershire, with a population of around 10,000 people (ONS, 2021).

Lydney's population resides mostly in suburban and rural areas. Its economy centres on healthcare, manufacturing and retail.



To help quantify the level of climate risks for Lydney, 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 Lydney, the UK climate projections 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.
- Sea level rise and storm surge is likely to result in increased flood risk at coastal locations.

PRIORITY CHALLENGES FOR LYDNEY

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

SEA LEVEL RISE

Increased risk of coastal flooding, tidal flooding and storm surge causing issues for low-lying communities.



TRANSPORT

Increased disruption to local transport due to future climatic changes (e.g., adverse weather days, rail buckling and road melt).



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 Lydney.



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.

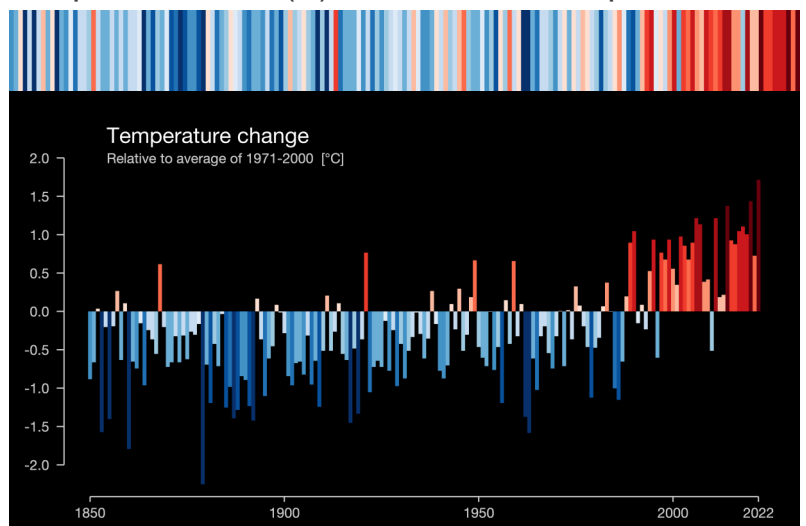


HISTORICAL TREND

How has Lydney's Climate Changed?

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

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 LYDNEY

COASTAL & TIDAL FLOODING

Sea level rise and storm surge change is likely to increase flood risk.



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.

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.



LYDNEY: SECTOR CLIMATE RISK INDICATORS

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



Rail: high temperatures

Days with Tmax above 30°C

	2050	2070	2100
Medium	3.6	6.6	8.7
High	6.3	15.7	24.6

Rail users, during summer, will increasingly experience disruption under both scenarios.



Heat Stress

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

	2050	2070	2100
Medium	0.7	1.6	2.6
High	1.7	5.9	10.3

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



Road melt risk

Days with Tmax above 25°C

	2050	2070	2100
Medium	30	42	51
High	43	66	79

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



Mean sea level rise (m)

Projected change in the time-mean coastal water level relative to the average value for the period 1981-2000

	2050	2070	2100
Medium	+0.28	+0.39	+0.54
High	+0.33	+0.51	+0.77

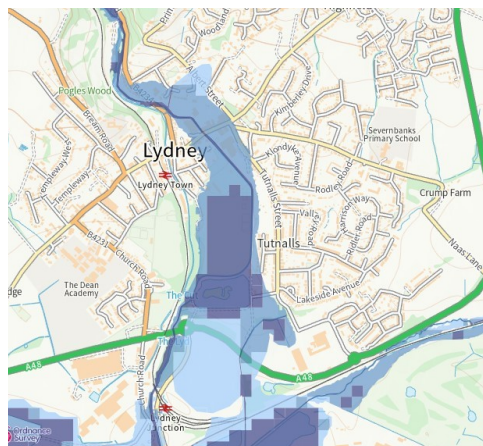
The above indicators were developed during the [UK Climate Resilience Programme](#) - funded by UK Research and Innovation and the Met Office (2023)

CURRENT AND FUTURE FLOODING

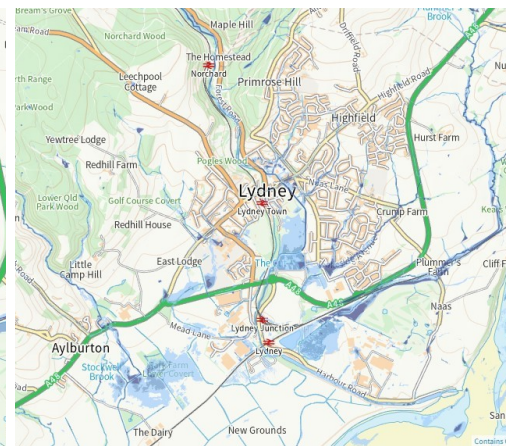
Some areas and locations in Lydney are currently at risk from tidal, river and surface water flooding.

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

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



Sea and River flooding



Surface water flooding

● High ● Medium ● Low ○ Very Low

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.

Future flooding in Lydney is likely to be caused by sea level rise and storm surges, as well as by rainfall. Under a high emissions scenario, sea level rise on the Severn Estuary could reach 1.14 metres by 2100** making flooding from storm surge conditions more likely and more serious.

*<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances> **95th percentile

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 Lydney Adapt to 2°C and assess the risks up to 4°C of warming.

Medium emissions scenario	2050s	2070s	2100
Annual Average temperature (°C change)	+1.4	+2.0	+2.3
Average Summer temperature (°C change)	+1.8	+2.7	+3.3
Average Winter temperature (°C change)	+1.1	+1.5	+1.7
Summer Rainfall (% change)	-15.2	-21.7	-24.9
Winter Rainfall (% change)	+8.6	+13.2	+15.5
Heatwave events (Events/year)	1.8	2.7	3.4
High emissions scenario			
Annual Average temperature (°C change)	+2.0	+3.2	+3.8
Average Summer temperature (°C change)	+2.7	+4.4	+5.3
Average Winter temperature (°C change)	+1.6	+2.5	+2.9
Summer Rainfall (% change)	-20.8	-30.8	-36.9
Winter Rainfall (% change)	+12.3	+20.9	+25.3
Heatwave events (Events/year)	2.8	4.0	4.2

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

TERMINOLOGY

Adaptation	In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities.
Fluvial flooding	Fluvial flooding occurs when rivers and streams break their banks and water flows out onto the adjacent low-lying areas.
'Locked in' Climate Change	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.
Mitigation	A human intervention to reduce emissions or enhance the sinks of greenhouse gases.
Scenario	A projection of future emissions, either following assumed future emissions or consistent with a specific increase in global average temperature.
UKCP18	UK Climate Projections 2018