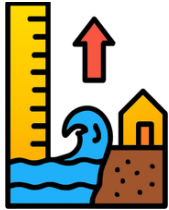
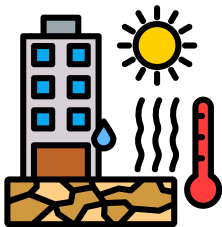


Climate Change

Our world is changing due to climate change, with rising temperatures, drought, sea level rise, flooding and many more. These changes to our environment are affecting systems we value and depend upon like ecosystems, water, agriculture, transportation, energy, wildlife and human health. These case studies look at four impacts of climate change on communities.



Coastal flooding: Climate change will impact coastal areas as sea level rises due to ice melt, and more severe and frequent storms increase the coastal erosion and flooding risk. It is important to consider how to reduce these impacts, as 40% of the world's population live within 100km of the coast, and many of the world's largest cities have been built on low-lying floodplains.



Heatwaves: Climate change is increasing the frequency of heatwaves in the summer months, with extreme heat no longer an anomaly. This is affecting the health and livelihood of millions of people. The World Health Organisation reported that in 2022 extreme heat killed over 60,000 people in Europe and the number of heat-related deaths could double by 2050.



Wildfires: The increase of extremely dry conditions in heatwaves and droughts due to climate change has caused an increase in frequency and severity of wildfires. Exposure to smoke from wildfires has many health impacts, with fine particles from wildfires causing over 100,000 premature deaths each year around the world.



Extreme rainfall: Climate change is impacting rainfall across the world. The hotter the air, the more moisture it can hold and so warm air over an ocean can create clouds with a greater number of large raindrops. This is why rain showers in the summer can be much heavier than in winter. Climate change is also shifting our weather patterns, including the position of the jet stream near the UK, causing some areas to become drier and others wetter.

GLOSSARY

Climate Refugee:
Day Zero Drought:
Floodplain:
Anomaly:
Atoll:
Jet stream:

Persons displaced in the context of disasters and climate change.
The point at which a city or other location runs out of water entirely.
A flat area of land next to a river that fills with water when the river overflows.
Something that is different or does not fit the usual pattern.
A ring-shaped island that surrounds a body of water called a lagoon.
Strong winds that blow from West to East, 5 to 7 miles above the Earth's surface.

[WHO](#) | [NOAA Climate.gov](#) | [Met Office](#) | [UNHRC](#)

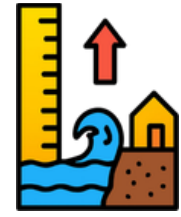


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Climate Change Case Study: Tuvalu

Type of Impact:	Sea Level Rise Flooding
Population:	11,000
Adaptation:	Land reclamation, migration
Timeline:	Under water by 2100



Coastal Flooding

Description

Tuvalu is a Polynesian island nation in the Pacific Ocean. It is made up of nine low-lying islands, six of which are atolls. The country's highest point of elevation is just 4.5 metres. In the last 30 years, the sea level has risen here by 21 centimetres, twice the global average! If this rate continues, it is estimated that 95% of the country may be under water by 2100.

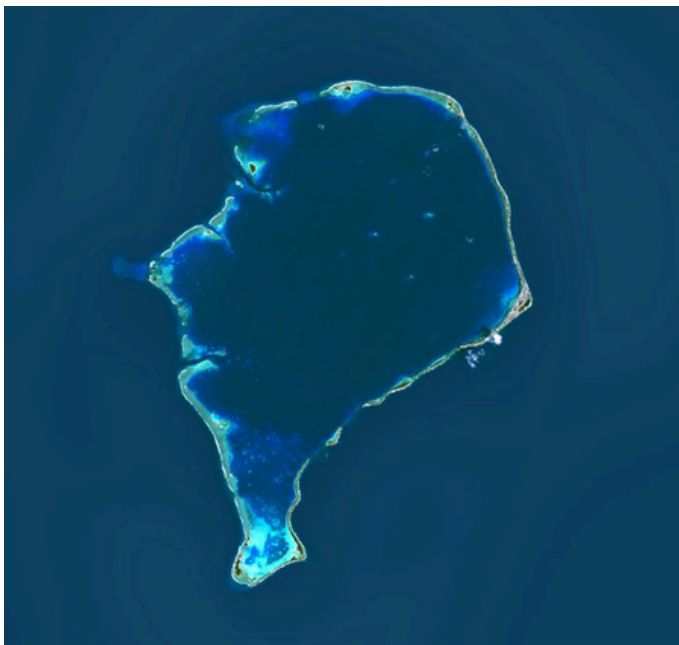


Tuvalu, South Pacific

1

Adaptations

To adapt to sea level rises, Tuvalu is moving sand to create new elevated land higher than the projected sea level in 2100 to protect against storm surges. Migration is also an option, the Australian government are offering 280 visas for Tuvaluans to relocate to Australia each year. Last year, 90% of the population applied. Tuvalu's foreign minister Simon Kofe said: "As our land disappears, we have no choice but to become the world's first digital nation". He recognises that if the physical territory is lost, Tuvaluans can still identify as members of the state of Tuvalu.



2

Sources consulted:

UN news

The Guardian

Graphics sourced from:

1. Britannica

2. The Guardian

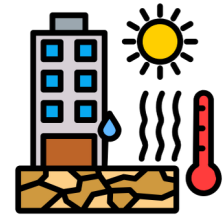


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Climate Change Case Study: Cape Town

Type of Impact:	Drought
Population:	4.2 million
Adaptation:	Campaigns, tariffs and technologies
Timeline:	2016-2018



Drought

Description

Three years of lower-than-average rainfall from 2015 to 2018 caused Cape Town in South Africa to suffer from the worst drought in 100 years. The government warned about Day Zero; the day that the city's taps would run dry and residents would have to go and collect a daily allowance of water. The threat of water shortage caused public panic amongst the 4.2 million residents, of whom 12% do not have access to running water in their homes.

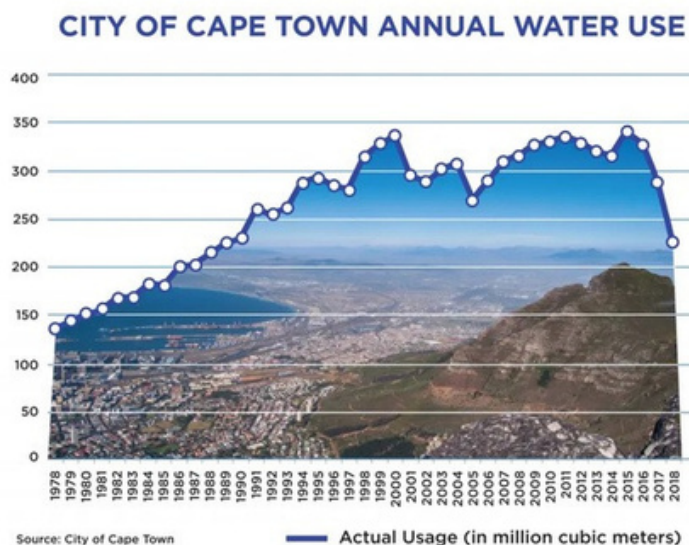


Cape Town, South Africa

1

Adaptations

To address the water shortage, the city of Cape Town urged people to drastically reduce their water usage through restrictions on water use, tariffs and media campaigns. Many public buildings, universities, offices, hotels and restaurants shut off water to bathroom taps and replaced them with hand sanitiser. The city installed emergency technologies to convert sea water into drinking water. Overall, this resulted in Cape Town using 50% less fresh water in the 3 years.



2

Sources consulted:

[Science Direct](#)
[Circle of Blue](#)

Graphics sourced from:

1.[Britannica](#)
2.[Circle of Blue](#)

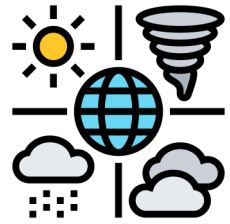


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Climate Change Case Study: Carmont

Type of Impact: Extreme rainfall
Number of people: 9 casualties
Adaptation: Improve drainage systems
Date: 12 August 2020



Extreme Rainfall

Description

Three hours of extreme rainfall caused a landslide over the railway line. A train travelling from Aberdeen to Glasgow collided with the debris, derailed and hit a bridge. The volume of rainfall in the three hours leading up to the crash were the equivalent of 90% of the average total rainfall in the month of August. Such an extreme rainfall event would be expected to happen only once in 100 years. Due to the warming climate, intense rainfall events are between 15 and 20% more likely to happen in the future as hotter air can hold more moisture.

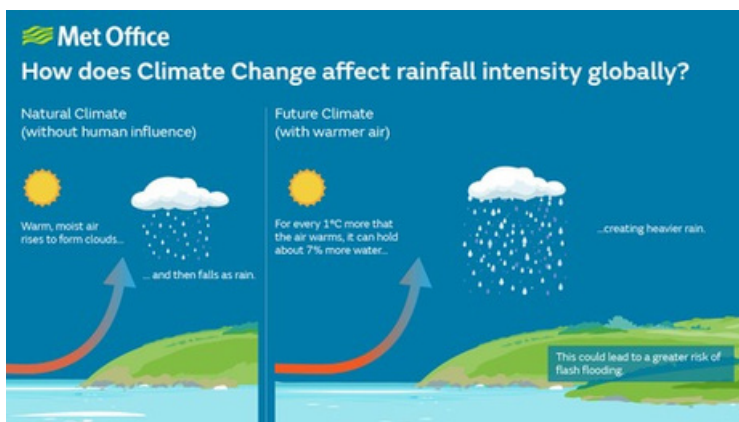


Carmont, Scotland

1

Adaptations

Three people were killed and six were injured in the crash. An investigation identified multiple failures by National Rail that led to the incident, including failing to tell the driver to reduce speed in adverse weather conditions and an incorrectly built drain unable to cope with the volume of water. National Rail are now investing over £400m to increase railway resilience to unpredictable weather. Global warming of more than 2°C over pre-industrial levels increases the likelihood of destructive downpours by 30-40%, highlighting the importance of reducing emissions.



2

Sources consulted:

[BBC News](#)

[University of Edinburgh](#)

Graphics sourced from:

1. [Britannica](#)

2. [Met Office](#)



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Climate Change Case Study: Bédar

Type of Impact: Wildfire
Population: 1000
Adaptation: New technologies, emergency texts
Date: 9 July 2026



Wildfire

Description

A heatwave with temperatures above 40°C has caused many wildfires across Southern Europe in the summer of 2026. A fire in Bédar in the south of Spain has killed 13 people, burnt through 17,300 acres of land, and the particulate matter in the smoke will cause further fatalities. The fire spread quickly due to high winds and abundant dry vegetation, partly caused by the migration of young people leaving rural farms for the city, allowing fuel for the fire to build up.



Bédar, Spain

1

Adaptations

As part of the emergency response, 220 soldiers and 160 law enforcement personnel were deployed to the area to combat the blaze, aid evacuation and find the cause of the fire. Longer term solutions could involve preventing wildfires by encouraging young people to stay and farm in the area to minimise highly flammable vegetation. To increase awareness and evacuation speed, emergency texts warning of the wildfire could be sent to residents. Investing in advanced fire fighting technology like helicopters could also increase ability to control wildfires.



Sources consulted:

2

[BBC News](#)

[The Guardian](#)

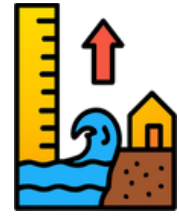
Graphics sourced from:

1. [Britannica](#)

2. [BBC News](#)

Climate Change Case Study: Fairbourne

Type of Impact:	Sea Level Rise Flooding
Population:	1,700
Adaptation:	Coastal defences, migration
Timeline:	Uninhabitable by 2054



Coastal Flooding

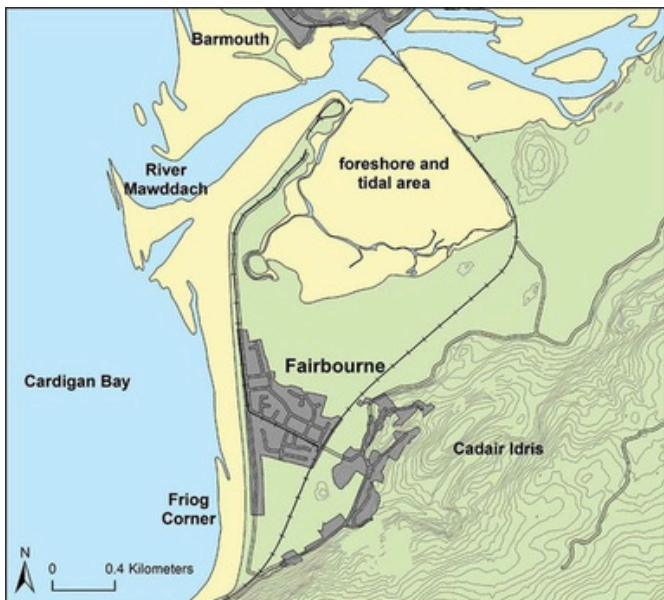
Description

Fairbourne is a small village on the west coast of Wales home to 1,700 people. It is built on a low-lying flood plain and with cliffs above, and a shingle beach with a gravel barrier and concrete defence blocks below. The village is at risk from both coastal and river flooding as the sea level rises and extreme weather causes flooding due to Climate Change.



Fairbourne, Wales

1



2

Sources consulted:
[Bangor University](#)
[Planning Practice & Research Journal](#)

Adaptations

Fairbourne is the first place in the UK to have been assigned the policy of “no active intervention” which is when a decision is made not to invest in providing or maintaining sea defences. Authorities have stated that by 2054 it will not be sustainable or safe for residents to remain in the village due to sea level rise. Therefore, the residents of Fairbourne are described as “the UK’s first climate change refugees”.

Graphics sourced from:

1. [Britannica](#)
2. [Taylor & Francis](#)



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