

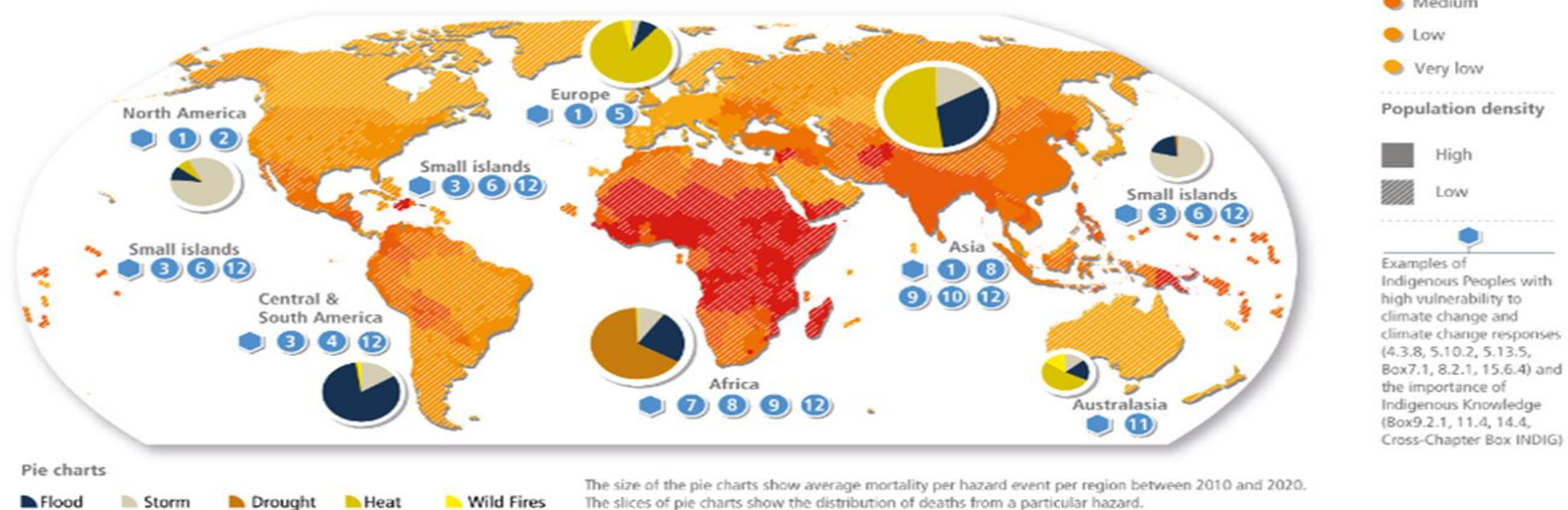
# Climate change vulnerabilities

## Activity

Observed human vulnerability to climate change is a key risk factor and differs globally

Vulnerability at the national level varies. Vulnerability also greatly differs within countries.

Countries with moderate or low average vulnerability have sub-populations with high vulnerability and vice versa.



What countries are most at risk.

Are there commonalities between these countries ?

How does the UK compare ?

What are the greatest examples of hazards that are affected by climate change?

# Locating our case studies

Alaska

Fairbourne, Wales



New  
England

New  
Orleans

Tuvalu

Describe the  
location of our  
case studies

# Sea Level Rise in Tuvalu



CR Liam Saddington

Vaitupu



CR Liam Saddington

Funafuti

Look at these two images: how do they show the threat of sea level rise in Tuvalu?

# Sea Level Rise in Tuvalu



Funafuti



Vaitupu

In your book: How is sea level rise threatening Tuvalu?

To describe different adaptation strategies

# Sea Level Rise in Fairbourne, Wales



How is sea level rise affecting Fairbourne?  
How is this different to Tuvalu?

To describe different adaptation strategies

Increased mental health issues due to forced relocation	Anxiety and stress from uncertainty about the future.	Businesses, like the campsite, depend on the village's existence.	Leaves the village more exposed to storms and tidal surges
700 residents will have to leave their homes.	£115m needed over the next 100 years to maintain flood protection	Water levels could rise by over 1m by 2054	Government funding for protection is uncertain.
The village's decommissioning threatens jobs and livelihoods.	Local businesses are struggling to attract investment.	Increased extreme weather events like storms and flooding.	Families are being forced to relocate.
House prices have dropped, and banks have stopped offering mortgages.	Anxiety and stress from uncertainty about the future	The shingle bank is gradually wearing away	Coastal erosion is accelerating each year

Shade the box  
Economic  
Social  
Environmental

# Tuvalu small island nation

Tuvalu is a small island nation located in the Pacific Ocean, midway between Australia and Hawaii. It consists of nine low-lying atolls and reef islands. With a population of around 11,000 people, Tuvalu is one of the world's smallest and most isolated countries. The highest point of Tuvalu is just 4.5 meters above sea level, making it extremely vulnerable to rising ocean levels caused by climate change. Since 1993, the sea around Tuvalu has been rising at an average of 4 millimeters per year, faster than the global average. This is due to thermal expansion (water expanding as it warms) and the melting of glaciers and ice sheets. Scientists predict that by 2050, sea levels could rise by 50-60 centimeters, and by 2100, the rise could reach over 1 meter.

For Tuvalu, this means frequent flooding, coastal erosion, saltwater intrusion into freshwater supplies, and damage to agriculture. Many people are forced to consider leaving their homes, making Tuvalu one of the world's first countries at risk of becoming uninhabitable due to climate change. The government of Tuvalu is actively seeking international support to adapt to climate change. They have called for urgent global action to reduce greenhouse gas emissions and are exploring solutions like building sea walls, improving water storage, and planting mangroves to protect the coast. However, long-term, the country may face the reality of having to relocate its population to other countries, like New Zealand or Australia.

Where is Tuvalu located, and why is it especially vulnerable to sea level rise?

How much has the sea risen around Tuvalu since 1993, and how does this compare to the global average?

List at least three impacts that rising sea levels have on Tuvalu.

What strategies is the Tuvaluan government exploring to cope with sea level rise?

# Temperature increase in US communities

## Activity 3

In recent years, temperature increases have been noticed in various parts of the United States, affecting regions like New Orleans, New England, and Alaska differently. In New Orleans, a city known for its vibrant culture and unique atmosphere, the temperatures have been rising. The warmer climate is bringing challenges such as more frequent and intense heat waves, as well as more powerful hurricanes, impacting both residents and the environment.

New England, characterised by picturesque landscapes and distinct seasons, is also experiencing changes in temperature. Winters are becoming milder, with less snowfall in some areas, while summers are becoming warmer. These shifts can influence ecosystems and the way people live, impacting activities like skiing in the winter and outdoor events in the summer.

Meanwhile, in the northernmost state of Alaska, the effects of global warming are particularly pronounced. The temperature rise is causing the permafrost—frozen ground—to thaw, leading to changes in landscapes and wildlife habitats. This poses challenges for indigenous communities that rely on traditional ways of life closely connected to the frozen environment.

### Questions:

- 1) What are the three places in the USA being affected by temperature increase?
- 2) What challenge is temperature increase bringing to New Orleans?
- 3) How is winter changing in New England and what challenges does this present?
- 4) How are people in Alaska being impacted?
- 5) Where do you think the biggest threats are to the USA?

# Contrasting case studies

## **Introduction**

Briefly introduce Tuvalu, Fairbourne and the U.S. community you are comparing

State the main issues both places face (e.g., rising sea levels, extreme weather, displacement).

## **Environmental Challenges**

Discuss how climate change affects each location (e.g., flooding, erosion, hurricanes, saltwater intrusion).

## **Social and Economic Impacts**

Compare how residents are affected (e.g., displacement, loss of livelihoods, mental health impacts).

## **Conclusion**

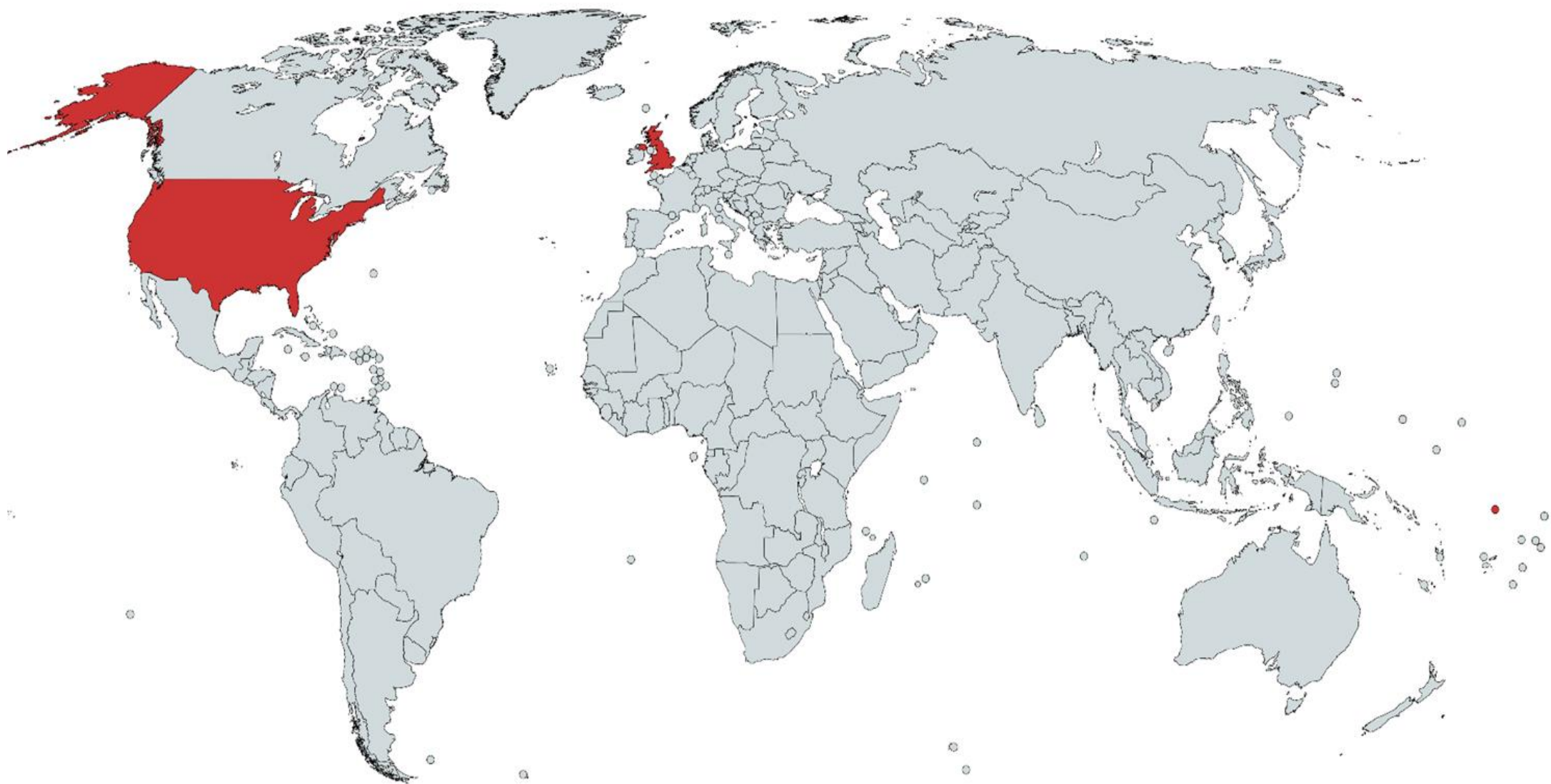
Summarise key similarities and differences.

What can be learned from these cases?

Suggest possible future solutions.

Compare the challenges faced by Fairbourne, Wales, with challenges faced by US and Tuvaluan communities

# Resources for lesson



## Temperature increase in US communities. Task 3

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In New Orleans, a city known for its vibrant culture and unique atmosphere, the temperatures have been rising. The warmer climate is bringing challenges such as more frequent and intense heat waves, as well as more powerful hurricanes, impacting both residents and the environment.

New England, characterised by picturesque landscapes and distinct seasons, is also experiencing changes in temperature. Winters are becoming milder, with less snowfall in some areas, while summers are becoming warmer. These shifts can influence ecosystems and the way people live, impacting activities like skiing in the winter and outdoor events in the summer.

Meanwhile, in the northernmost state of Alaska, the effects of global warming are particularly pronounced. The temperature rise is causing the permafrost, frozen ground, to thaw, leading to changes in landscapes and wildlife habitats. This poses challenges for indigenous communities that rely on traditional ways of life closely connected to the environment.

Although the United States is one country, there is a lot of variation in how climate change is affecting different states and cities.

### Questions:

What are the three places in the USA being affected by temperature increase?

What challenge is temperature increase bringing to New Orleans?

How is winter changing in New England and what challenges does this present?

How are people in Alaska being impacted?

Where do you think the biggest threats are to the USA?