

# Climate change



## What is climate change?

### Weather vs Climate

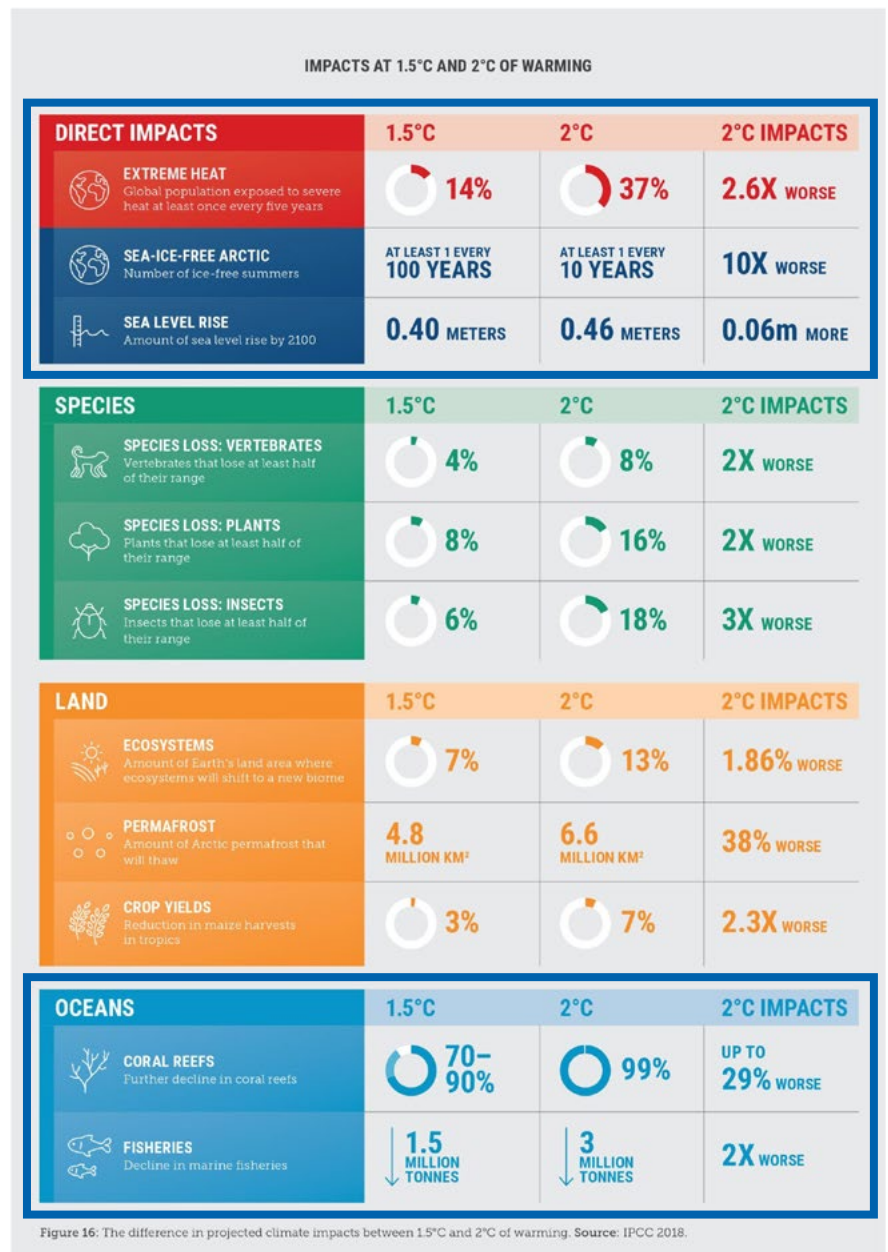
Weather is the short-term conditions in the atmosphere, such as rain, humidity, temperature, air pressure or wind. The weather can change over a few hours, days or weeks. For example, it could be sunny, cloudy, rainy, foggy, cold, hot, windy, stormy, snowing etc.

Climate refers to average weather conditions over longer periods, usually 30 years or more. Climate conditions vary between different regions of the world and influence the types of plants and animals that live there.

### Our climate is changing

The global climate is changing much faster now than it has in the past, and human activities are a leading factor contributing to this acceleration; including the burning of fossil fuels such as coal, gas and oil, which we use for transport, energy production and industry.

In the next 20 years, climate change will affect key components of the marine estate; ocean temperatures, sea level, the supply of nutrients, ocean chemistry, food chains, wind systems, ocean currents and extreme events such as east coast lows. These changes pose a risk to marine and coastal ecosystems, and the species that rely on them.



Source: climatecouncil.org.au

# Global warming

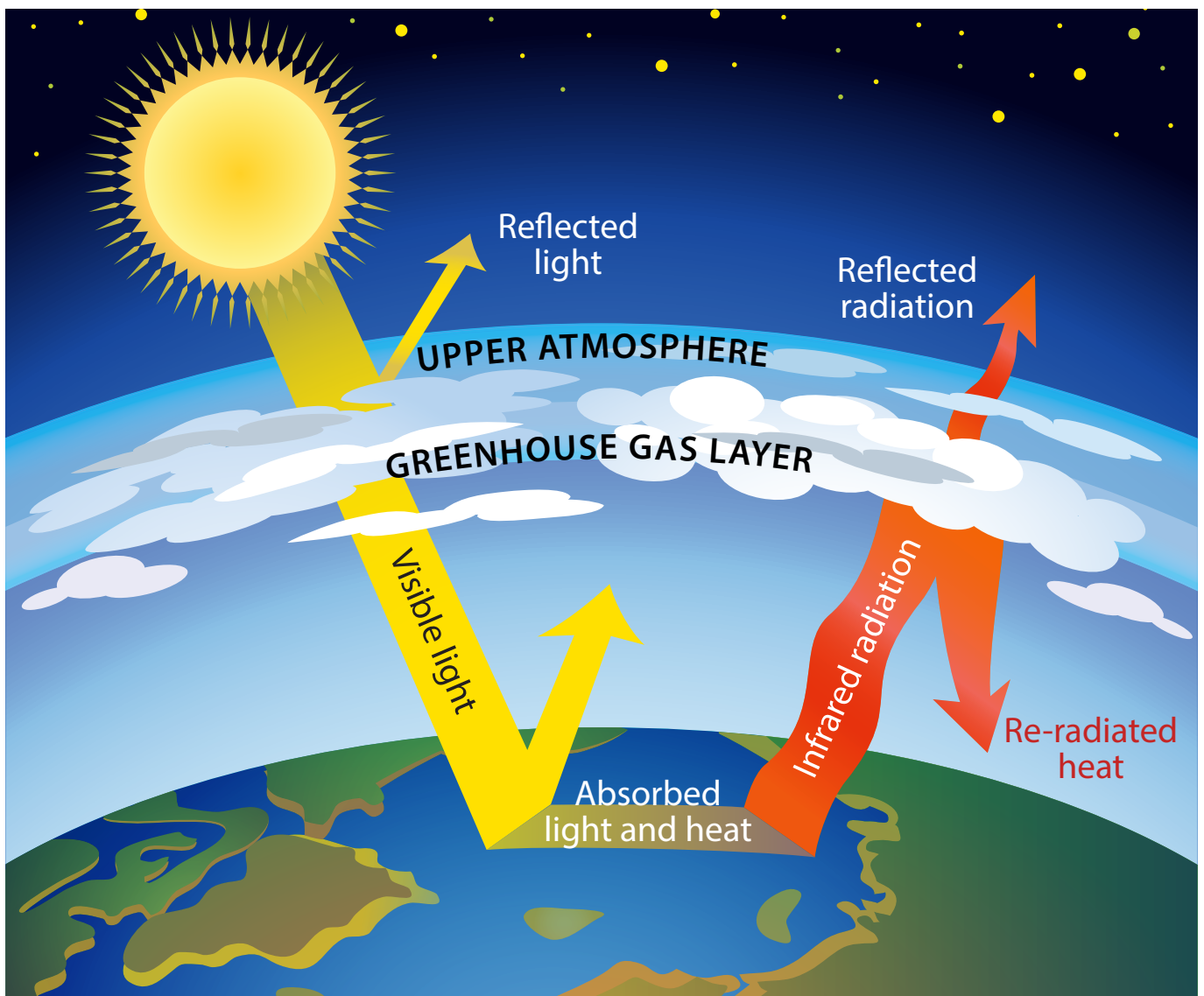
Global warming is caused by the increase of carbon dioxide and other greenhouse gases in the atmosphere.

It's also referred to as the *Greenhouse Effect*.

## How does it work?

Greenhouse gases trap the sun's radiation under an invisible 'blanket' in the atmosphere, warming up the Earth. The more greenhouse gases humans produce, the warmer the planet becomes.

Our oceans absorb a lot of the radiation from the sun. As oceans get warmer, there is a flow-on effect around the world. Rising sea temperatures impact weather patterns, marine life and our lives.



# Rising sea levels

## What's causing our sea levels to rise?

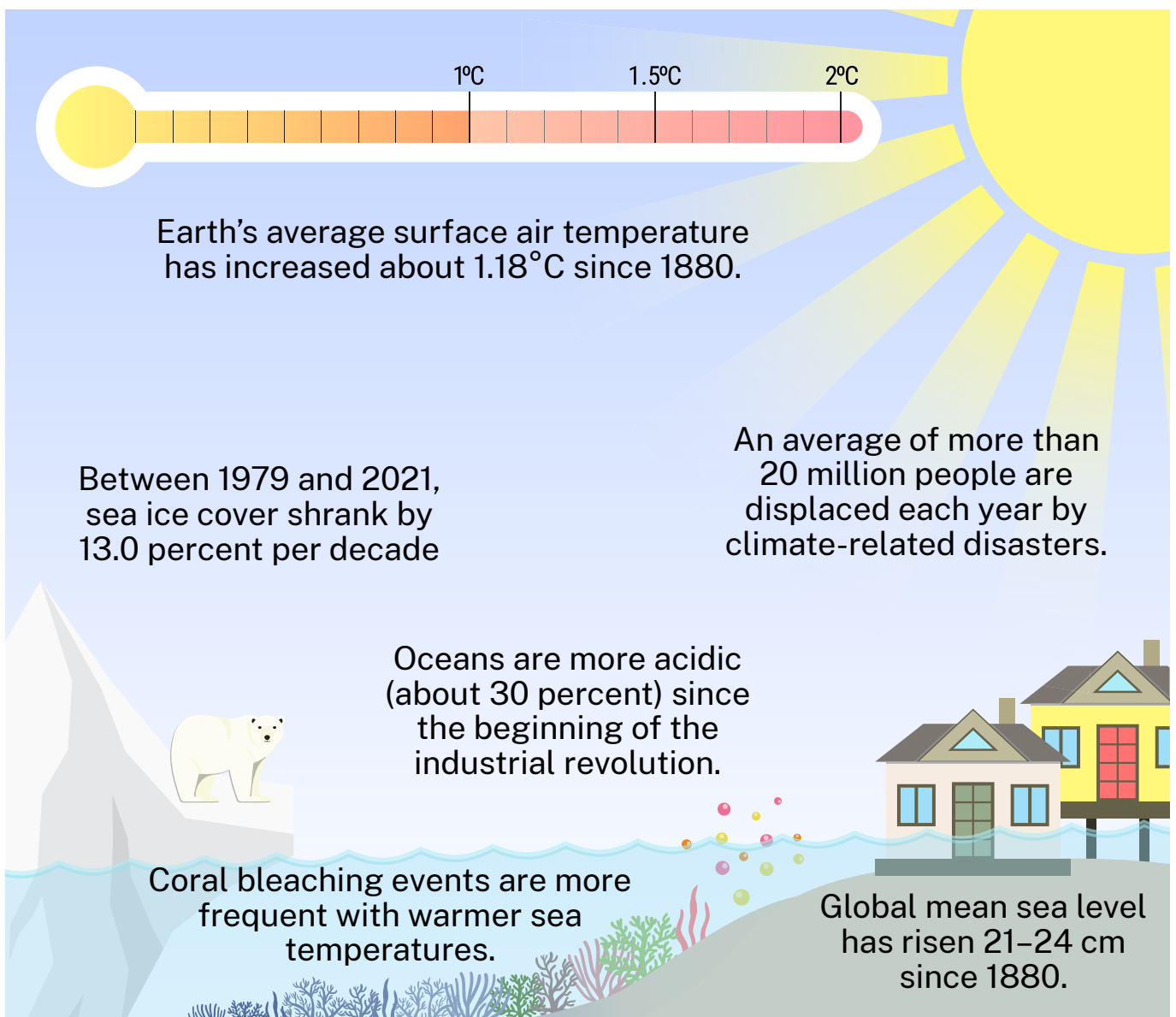
One of the effects of global warming is rising sea levels. This impact is caused in two ways:

1. The oceans absorb heat and as the water gets warmer, it expands causing sea levels to rise.
2. Polar ice on land and sea ice is melting far quicker than normal and is not being replenished enough during winter.

## Risks of rising sea levels

Rising sea levels pose a great risk to coastal communities around the world. As a result, some isolated islands are disappearing, and the residents are becoming 'climate refugees'.

Humans aren't the only ones affected; as more frequent storm surges erode beaches, there is limited breeding habitat for shorebirds and sea turtles, seagrass meadows can become smothered by sand and other coastal debris.



# Warmer waters

Climate change affects ocean temperatures as well as wind patterns — together, these can alter oceanic currents.

The most significant ocean current in NSW is the East Australian Current (EAC). The EAC brings warm water down from the Great Barrier Reef before turning near Sydney to head east.

Below Sydney are large ocean eddies that circulate the warmer waters down toward Tasmania. Many marine species rely on this current for food and transport.

One impact of the EAC becoming warmer for longer is that tropical species can move further south into more temperate waters. This impacts kelp forests, as new predators are moving into the forests and eating them. This loss of habitat affects many more species than just the kelp.



## For more information

*Click or Scan the QR Codes*

**What is the East Australian current?**  
Video



**ABC iView Australia's Ocean Odyssey Episode 2**  
Video



You will need an ABC iView account to watch this episode.

Scientific researcher with crayweed  
(John Turnbull - operationcrayweed.com)



# Impacts on marine life

Impacts of climate change on marine life have already been observed worldwide – largely due to long-term data that enables researchers to monitor changes over many decades.

## Acidification

As well as affecting the Earth’s climate, carbon dioxide emissions can also cause ocean acidification.

Coral reefs around the world are experiencing significant coral bleaching, which is largely caused by heat stress. Acidification of ocean water further impacts these stressed organisms by reducing their ability to build and repair their skeletal structure.

As well as impacting coral reefs, acidification can also dissolve the calcium carbonate that makes up the shells of many marine species, such as crabs, scallops, crayfish, and some plankton.

Research by Australian scientists indicates there will inevitably be flow-on implications for human societies and economies, particularly those in coastal regions of Australia that are highly dependent on the marine environment and its resources.

Researcher surveying coral bleaching (Australian Institute of Marine Science).

