



This resource provides links to a large number of resources (particularly visualisations) to assist with the teaching of climate change. As web links change over time, we would be grateful if you could [contact us](#) if any of them no longer work (all accessible June 2019).

Contents

- [Natural Processes that Impact Climate](#)
- [Evidence of Climate Change](#)
- [Human Impact on Atmospheric Composition](#)
- [Impacts of Climate Change](#)
- [Climate Change Models](#)

Natural Processes That Impact Climate

Oceanic circulation

- [A visualisation of wind and ocean circulation layers.](#) This is for current movement but it gives students an idea of just how much oceanic circulation is occurring. Created by NASA/Goddard Space Flight Center Scientific Visualization Studio.

Milankovitch cycles

- [An interactive that allows you to explore eccentricity, precession and tilt](#) and also looks at the Vostok Ice Core. Created by the University of Wisconsin. Be sure to read the instructions!

Plate tectonic supercycle

- [An animation showing 540 million years of plate tectonics and paleogeography.](#) Created by Christopher Scotese.

Changes over time

- [Australia through Time.](#) A poster by Geoscience Australia that shows where Australia was on the globe, outlines conditions, relative sea level, mass extinctions and more over geological time. [Geoscience Australia](#) also offers geological time walks in applications and on your computer.



Evidence of Climate Change

Ice core data

- [Ice core data from the EPICA Dome C](#) (Antarctica) from the British Antarctic Survey. Created by the Natural Environment Research Council.

Isotopic ratios

- An article and visualisation about [oxygen ratios and climate change](#) research from NASA Earth Observatory.

Human Impact on Atmospheric Composition

Overview

- An [infographic covering global climate change](#) in relation to data, causes, evidence, vulnerable cities and possible solutions. Please note that some minor correction/discussion regarding interpretations may need to be had. Created by Shangnin Wang and available at Behance.
- [Human vs. natural influences on climate using graphs](#) created by the United States Environmental Protection Authority.
- [Climate science explained in ten graphics](#). Created by Kelly Levin and available at World Resources Institute.
- [Shares of global anthropogenic greenhouse gas emissions](#). Created by Kjell Aleklett, available on ResearchGate.

Deforestation

- An [infographic of the top 11 worst countries for deforestation](#), according to WWF. Available through the ABC.

Fossil fuel consumption

- [Graph of average life-cycle of carbon dioxide equivalent emissions for a number of energy sources](#). This shows that fossils fuels are very high. Created by the IPCC and available through the World Nuclear Association:

Resourced by



Carbon emissions

- [Greenhouse gas emissions graphs worldwide by country and economic sector](#), created by the EPA, cited in paper by David Parker and available through the World Economic Forum.
- An [interactive infographic looking at what would need to be done to meet carbon emissions targets](#). Created by Kennedy Elliott and available through National Geographic.

Impacts of Climate Change

Species distribution changes ~21,000 years ago

- [Information and visualisations around the Last Glacial Maximum and the Bering Land Bridge](#). Created by Manley, W.F., 2002, Postglacial Flooding of the Bering Land Bridge: A Geospatial Animation: INSTAAR, University of Colorado, v1 (Please note that it only opens on some browsers, such as Internet Explorer).

Species distribution, crop productivity, sea level, rainfall patterns, surface temperature and extent of ice sheets

- [Infographic comparing the impacts of a 1.5°C VS 2°C rise](#) produced by the World Wildlife Fund.
- [Images of change series](#) shows before and after photos of areas impacted by climate change including by flood, fire and glacier movement. Created by NASA.
- [An article outlining a number of impacts of climate change, reducing these impacts and some great infographics](#) (including one on sea ice extent). Created by the BBC.
- An [infographic summarising a number of impacts of climate change](#). Created by Weather Underground.

Extent of ice sheets, sea level rise and surface temperature

- [Online interactives for students](#) (a number hover over North America). Sea ice cover from 1979 to 2018, sea level rise 0-6m, atmospheric carbon dioxide from 2002 to 2016 and global temperatures from 1884 to 2018. Created by NASA Scientific Visualization Studio.

Extent of ice sheets

- [Online interactives examining glaciers across the world](#). Includes links to time lapse videos of changes. Created by the NASA Scientific Visualization Studio.



Surface temperatures

- [Visualisation of temperature anomalies by country \(1880-2017\)](#). Created by Antti Lipponen
- A [series of visualisations on surface temperature changes brought into one post](#). Written by Andrew Freeman and available at Mashable Australia.
- [Global temperature anomalies by year globally](#). Scroll across to see Australia. Created by NOAA GHCN-Daily database and available at Flourish.

Species distribution

- Article '[Climate Change Is Messing With Your Dinner](#)' by Agnieszka de Sousa and Hayley Warren and available at Bloomberg. Includes great visualisation around projected wheat yields, coffee and food dependence.

Vulnerability

- [A number of visualisations](#) around carbon dioxide, global temperatures, artic ice, sea levels, global action, \$ spent, recipients of support and global readiness. Created by Density Design.
- [A visualisation of countries around the world based on their emissions and vulnerability to climate change](#). Created by Milken Institute School of Public Health.

Student Quizzes

- The following [quizzes](#) are available: Soil moisture, The ocean, clouds and aerosols, The air we breathe, Carbon, Our home planet, Frozen poles, Precipitation and the water cycle, Our world/other worlds, Warm up, Freeze frames, Sea change, How's your energy level?, Sea salt and it's a gas. Created by the Earth Science Communications Team at NASA.

Resourced by



Climate Change Models

Global visualisation

- [Eyes on the Earth](#) a 3D visualisation of the globe using NASA's operating Earth- observing missions. This needs a desktop application download however download is quick. There are a huge number of datasets represented across the globe and in full colour and a number of parameters can be adjusted to suit. Datasets include global temperature, carbon dioxide, sea level, salinity and many more unrelated to climate change (including a gravity field map, root zone soil moisture and the chance to interact with a number of missions to understand their scale). Created by JPL for NASA.

Ocean circulation

- A [summary from the Intergovernmental Panel on Climate Change, Working Group](#). This covers the impacts of warming on oceans and the possible consequences of the switching off of the Gulf Stream. Available at the Parliament of Australia site.
- A broader [summary of the impact of warming on oceans](#) covering water temperature, ocean acidification and deoxygenation. Created by the International Union For Conservation of Nature.
- An [article outlining findings that bring the idea that climate change is slowing ocean circulation into debate](#). This talks a little about technology, climate science and the debate that exists. Written by Carolyn Gramling and available at ScienceNews.

El Niño and La Niña

- Short animation by the Woodside Australian Science Project (WASP) looking at how [El Niño and La Niña](#) period differ and their impact on Australia.

Credit:

Thank you to Orana Velarde for the blog '[The Best Data Viz and Infographics on Climate Change Facts](#)' that led us to lots of great resources.

Resourced by

