

Climate change: challenges and solutions

FURTHER READING

Earth system science, the carbon cycle & feedbacks

Books:

Revolutions that made the Earth

by *Tim Lenton & Andrew Watson*:

<http://ukcatalogue.oup.com/product/9780199587049.do>

The Ages of Gaia; A Biography of Life on Earth

by *James Lovelock*:

<http://ukcatalogue.oup.com/product/9780192862174.do>

Web links:

Exeter scientists show sensitivity of carbon cycle to tropical temperature variations has doubled: <http://tinyurl.com/nz3m5jz>

Climate change: Rainforest absorption of CO₂ becoming erratic - *The Independent*:
<http://www.independent.co.uk/news/science/climate-change-rainforest-absorption-of-co2-becoming-erratic-9086304.html>

Risk of supervolcano eruption big enough to 'affect the world' far greater than thought, say scientists:

<http://www.independent.co.uk/news/science/risk-of-supervolcano-eruption-big-enough-to-affect-the-world-far-greater-than-thought-say-scientists-9040073.html>

Retreat of Arctic sea ice reduces Earth's reflectivity faster:

<http://1.usa.gov/1h2qV5b> pic.twitter.com/dpWdm68Qcf

National Geographic: Why the oceans matter:

<http://video.nationalgeographic.com.au/video/.UvScdRiGYhQ.twitter>

Oceanic viruses are unexpectedly key players in ecosystems and biogeochemical cycles:

<http://f1000.com/prime/reports/b/4/17/>

Past climate change

Web links:

A nice introduction to palaeoclimatology:

<http://www.globalchange.umich.edu/globalchange1/current/lectures/klings/paleoclimate/>

PAGES is a core programme of the International Geosphere-Biosphere Programme bringing together research on the past climate:

<http://www.pages-igbp.org/news/all-news-items/9-latest-news/13-welcome-to-pages>

US National Oceanic and Atmospheric Administration palaeoclimatology page:

<http://www.ncdc.noaa.gov/data-access/paleoclimatology-data>

800,000 year record of CO₂:

https://www.youtube.com/watch?v=vA7tfz3k_9A

Carbon Brief : Solar Activity and Little Ice Age:

<http://www.carbonbrief.org/blog/2013/11/solar-activity-and-the-so-called-%E2%80%9Clittle-ice->

age%E2%80%9D

Also see books mentioned in 'Earth system science, the carbon cycle & feedbacks'

Overview of Climate Change

Books:

Global Warming: A Very Short Introduction

by Mark Maslin:

<http://ukcatalogue.oup.com/product/9780199548248.do>

Web links:

New Scientist – Climate change page:

<http://www.newscientist.com/topic/climate-change>

A great chart showing GHG emissions and their sources:

<http://www.wri.org/resources/charts-graphs/world-greenhouse-gas-emissions-2005>

IPCC AR5 Working Group 1, Summary for policy makers:

http://www.climatechange2013.org/images/report/WG1AR5_SPM_FINAL.pdf

Climate guide - Met Office:

<http://www.metoffice.gov.uk/climate-guide>

Climate News Network: Run by four volunteers, all veteran journalists who have covered climate change for many years for leading newspapers:

www.climatenewsnetwork.net/

An interesting take on the 5th IPCC Report:

https://www.youtube.com/watch?v=I0McGUF9hc0&feature=youtube_gdata_player

Hans Rosling's talk for launch event of IPCC WGI summary for policymakers '200 years of global change':

<https://www.youtube.com/watch?v=grZSxoLPqXI>

Observing climate change

Web links:

New Scientist maps of temperature change between 1980 and now.

<http://warmingworld.newscientistapps.com/>

UEA – google Earth temperatures and precipitation:

<https://www.uea.ac.uk/mac/comm/media/press/2014/February/cru-google-earth>

Global warming proponents and sceptics agree on one point: study into myth of 'pause' merits more research:

<http://www.independent.co.uk/environment/climate-change/global-warming-proponents-and-sceptics-agree-on-one-point-study-into-myth-of-pause-merits-more-research-8947522.html>

NASA | Six Decades of a Warming Earth: http://youtu.be/gaJtS_WDmI

What will the future hold? Modelling climate change & the IPCC

Books:

"Climate Modelling: a primer" by Henderson-Sellers & McGuffie, now in its 4th edition:

<http://www.climatemodellingprimer.net>

Web links:

Evaluation of Climate Models

http://www.climatechange2013.org/images/report/WG1AR5_Chapter09_FINAL.pdf

Long-term Climate Change: Projections, Commitments and Irreversibility

http://www.climatechange2013.org/images/report/WG1AR5_Chapter12_FINAL.pdf

Tyndall centre – Climascope

<http://www.tyndall.ac.uk/communication/news-archive/2014/making-sense-climate-models>

All Models are Wrong - *Tamsin Edwards*:

<http://blogs.plos.org/models/category/introductory/>

Climate Lab book - *Ed Hawkins*:

<http://www.climatelabbook.ac.uk/2014/cascadeofuncertainty/>

The uncertainty cascade in CMIP5 global temperature projections:

<http://www.climate-lab-book.ac.uk/2014/cascade-of-uncertainty/>

The projected timing of climate departure from recent variability:

<http://go.nature.com/jg2pZh>

Time to model all life on Earth:

<http://www.nature.com/nature/journal/v493/n7432/full/493295a.html>

A new GHG to worry about:

<http://www.examiner.com/article/new-greenhouse-gas-powerful-gas-has-unknown-potential-major-threat-to-climate?cid=RSS-EX-topnews>

A short blog article on the way the IPCC works – *Matt Collins*

https://www.climateandus.com/blog/Workings_IPCC/

Amazing timelapse satellite images of the world over the last 30 years:

<http://world.time.com/timelapse/>

Climate change and the weather

Web links:

Unchecked global warming 'will double El Niño weather events':

<http://gu.com/p/3mxcy/tw>

Indian Ocean climate changes point to drier, more fire-prone future in Australia:

<http://www.smh.com.au/environment/climate-change/indian-ocean-climate-changes-point-to-drier-more-fireprone-future-20131128-2yef9.html>

Live mapping of wind and ocean currents:

<http://earth.nullschool.net/>

Carbon Brief on recent media reports - are recent storms a sign of climate change? Including week 3's Matt Collins:

<http://www.carbonbrief.org/blog/2014/02/mail-on-sunday-falsely-claims-met-office-scientists-disagree-about-climate-change-link-to-recent-uk-weather/>

England and Wales hit by wettest winter in nearly 250 years:

<http://google.com/newsstand/s/CBIw25Talxk>

Ice melt and sea level rise

Web links:

The life aquatic: How the Earth would look if all the ice melted:

<http://www.independent.co.uk/environment/climate-change/the-life-aquatic-how-the-earth-would-look-if-all-the-ice-melted-8925734.html>

Melting Arctic sea ice could increase summer rainfall in northwest Europe suggests new study:

http://www.exeter.ac.uk/news/featurednews/title_329022_en.html?utm_source=exeter.ac.uk&utm_medium=billboard&utm_campaign=HomeSeaice#.Un0Glb3A1-A.twitter

Interactive image comparison pics of glaciers:

<http://tinyurl.com/p8oypur> & <http://tinyurl.com/qgd88ar>

Ars Technica: Greenland glacier sets glacial speed record:

<http://arstechnica.com/science/2014/02/greenland-glacier-sets-glacial-speed-record/>

AR5 IPCC Climate Change 2013 The Physical Science Basis. Section 4 on observations: Cryosphere:

http://www.climatechange2013.org/images/report/WG1AR5_Chapter04_FINAL.pdf

A nice article about ice-melt in Greenland:

<http://www.rollingstone.com/greenland-melting>

Retreat of Arctic sea ice reduces Earth's reflectivity faster:

<http://1.usa.gov/1h2qV5b> pic.twitter.com/dpWdm68Qcf

Feeding the world

Books:

Harvesting the Biosphere: What we have taken from nature

by Vaclav Smil

<http://www.vaclavsmil.com/harvesting-the-biosphere-what-we-have-taken-from-nature/>

Rambunctious garden

by Emma Marris

<http://www.bloomsbury.com/uk/rambunctious-garden-9781608194544/>

Should we eat Meat?: The evolution and consequences of modern carnivory

by Vaclav Smil

<http://www.vaclavsmil.com/should-we-eat-meat-evolution-and-consequences-of-modern-carnivory/>

Waste: Uncovering the global food scandal

by Tristram Stuart

<http://www.tristramstuart.co.uk/>

Feeding the World: A challenge for the 21st century

by Vaclav Smil

<http://www.vaclavsmil.com/feeding-the-world-a-challenge-for-the-twenty-first-century/>

Web links:

'The other inconvenient truth': Jon Foley's TED talk on the need for an agricultural revolution:

<https://www.youtube.com/watch?v=uJhgGbRA6Hk>

Hidden crop pest threat to poorer nations revealed - University of Exeter:

http://www.exeter.ac.uk/news/featurednews/title_355911_en.html?utm_source=exeter.ac.uk&utm_

[medium=billboard&utm_campaign=HomeCroppest#.Uvyzy_Vo020.twitter](#)

An inspiring group trying to bring about a change in farming from the bottom up:
<http://www.oxfordrealfarmingconference.org/>

US Environmental Protection Agency: Climate impacts on agriculture:
<http://www.epa.gov/climatechange/impacts-adaptation/agriculture.html>

Report on food waste by the Institution of Mechanical Engineers:
<http://www.imeche.org/knowledge/themes/environment/global-food>

UK Government Foresight report: The Future of Food and Farming:
<http://www.bis.gov.uk/assets/foresight/docs/food-and-farming/11-546-future-of-food-and-farming-report.pdf>

Ocean Acidification

Books:

Ocean acidification:

Edited by Jean-Pierre Gattuso & Lina Hansson

<http://ukcatalogue.oup.com/product/9780199591091.do>

Web links:

Hot tub time machine:

<http://www.onearth.org/articles/2014/02/elizabeth-kolberts-scary-swim-in-the-acidic-oceans-of-tomorrow> (about ocean acidification)

Nature comment piece on Ocean Acidification:

<http://www.nature.com/nature/journal/v498/n7455/full/498429a.html>

Ocean acidification special issue of the journal Marine Biology

<http://link.springer.com/journal/227/160/8>

Biological/ecological responses to climate change

Web links:

As Arctic Melts, Marine Mammals Become Sentinels for Disease:

<http://theyee.ca/News/2014/02/18/Arctic-Mammals-Diseases/>

Climate change 'could be making fish smaller' say researchers:

<http://bbc.in/1ednYQ3>

Climate change and evolution on ecological timescales:

<http://ecoevoeco.blogspot.fr/2014/01/climate-change-and-evolution-or-not.html>

Geoengineering

Web links:

Royal Society report:

<http://royalsociety.org/policy/publications/2009/geoengineering-climate/>

MIT Technology Review: The Geopolitics of Geoengineering:

<http://google.com/newsstand/s/CBIw9szqxw4>

Man-made eruptions – ‘Plan B’ in the battle for the planet:

<http://www.independent.co.uk/environment/climate-change/manmade-eruptions-ndash-plan-b-in-the-battle-for-the-planet-1780268.html>

David Keith's TED talk on geoengineering:

<https://www.youtube.com/watch?v=XkEys3PeseA>

Adaptation and mitigation

Books:

Design for Climate Change

by *Bill Gething*

<http://www.ribabookshops.com/item/design-for-climate-change/77532/>

Sustainable energy without the hot air

by *David Mackay*

Can be downloaded for free here: <http://www.withouthotair.com/>

Or a hard copy: <http://www.uit.co.uk/BK-SEWTHA/HomePage>

Sustainable materials with both eyes open

by *Julian Allwood & Jonathan Cullen*

<http://www.withbotheeyesopen.com/>

Energy at the Crossroads: Global perspectives and uncertainties

by *Vaclav Smil*

<http://www.vaclavsmil.com/energy-at-the-crossroads-global-perspectives-and-uncertainties/>

Web links:

Some interesting current research projects:

Living With Environmental Change: <http://www.lwec.org.uk/our-work/climate-mitigation>

Adaptation and Resilience in the Context of Change: <http://www.lwec.org.uk/activities/arcc>

Scientific American: Cool roofs might be enough to save cities from climate overheating:

<http://www.scientificamerican.com/article/cool-roofs-might-be-enough-to-save-cities-from-climate-overheating/>

Thoughts of a design team: Barriers to low carbon school design:

<http://goo.gl/iEwzvp>

See this interactive Energy Efficient House & reduce your usage:

<https://www.electricireland.ie/ei/residential-energy-services/reduce-your-costs/interactivehouse/index.html> ... pic.twitter.com/QsW6BeV4rZ

The Guardian: Are we on the verge of solving climate change?

<http://gu.com/p/3kbcy/tw>

Encouraging sustainable behaviour:

<http://talkingclimate.org/guides/sustainable-behaviour/>

Dr Tim Fox calls for public debate on the resilience of UK infrastructure

<http://www.imeche.org/news/institution/dr-tim-fox-calls-for-public-debate-on-the-resilience-of-uk-infrastructure#.Uw743VvJ1yc.twitter>

Database of links to information on energy statistics:

<http://energystats.wordpress.com/>

Climate change and society

Books:

Renewable Energy and Public: From NIMBY to Participation.

Edited by Patrick Devine-Wright

http://geography.exeter.ac.uk/staff_profile_images/Renewable_Energy_and_the_Public-3.pdf

Web links:

200 years of global change, Hans Rosling:

<https://www.youtube.com/watch?v=grZSxoLPqXI>

Population, Hans Rosling:

http://www.ted.com/talks/hans_rosling_religions_and_babies.html

Why women are the secret weapon to tackling climate change

http://edition.cnn.com/2014/03/06/world/why-women-are-the-secret/index.html?sr=sharebar_twitter

The Guardian: Majority of red-state Americans believe climate change is real, study shows.

<http://google.com/producer/s/CBIwkuTUqQ4>

An insider's view of the lack of science literacy in US congress

http://www.salon.com/2014/03/03/gops_inane_war_on_science_plasma_physicist_congressman_takes_on_the_denialists/

A couple of nice examples of citizen science:

Realtime flooding hotspots & pics with social media: <http://ow.ly/txCfb>

Mapping of global croplands: http://www.eurekalert.org/pub_releases/2013-11/iifa-ccg111513.php

“You can't argue with a rock": CEO of world's largest mining company says climate change is real, driven by humans:

<http://fuelfix.com/blog/2014/03/04/energy-ceo-climate-change-is-real-and-driven-by-humans/>

Tipping Points

Weblinks:

On the origin of planetary scale tipping points:

<http://www.sciencedirect.com/science/article/pii/S0169534713001456>

Tipping elements in the Earth's Climate System (by Tim Lenton):

<http://www.pnas.org/content/105/6/1786.abstract>

Early warnings of simulated Amazon dieback:

http://figshare.com/articles/Early_warning_signals_of_simulated_Amazon_dieback/801095