Welcome to the Anthropocene



Informing people about the new world order

The impact of human activity upon our planet is now so profound and potentially long-lasting that the renaming of our geological era as the Anthropocene – ' the age of humans' - is being advocated by a growing body of scientists. In parallel, there is growing consensus that the Earth is undergoing the 'Sixth Mass Extinction', a permanent loss of multiple species caused not by natural phenomena but human activity.

The public rely on many institutions and organisations to inform them about the natural world. Many address the impact of human activity but such is the pace and intensity of the changes now happening that the gravity of the current situation is rarely fully presented. In particular, the interrelated effects of exponential population growth and massively expanding consumption are frequently underrepresented or neglected.

The public has a right to the information about these critical developments and urgent threats, to allow them to make decisions about their own actions and seek changes from policymakers which can ameliorate or avert the ongoing crisis in the natural world. Organisations which take on the responsibility of informing the public about natural history have the authority, expertise and duty to provide that vital service.

RECENT GEOLOGICAL TIME SCALE

	Millions of years ago	Epoch	Period
	0.01	HOLOCENE	OLIATEDNIADY
	2.6	PLEISTOCENE	QUATERNARY
	5.3	PLIOCENE	NEOCENE
	23.0	MIOCENE	NEOGENE
	33.9	OLIGOCENE	
	56.0		PALEOGENE
	66.0		

The Anthropocene

Planetary scientists divide Earth's history into geological time spans such as "periods" and "epochs". Our current epoch is the Holocene, which began approximately 12,000 years ago. Now, a growing body of scientists from multiple disciplines are proposing the official recognition of a new epoch, the **Anthropocene**, to recognise the human impact upon the Earth's biodiversity, climate and other ecosystems.

That term's official adoption as a geological era is currently being considered by the global scientific body responsible for these classifications, the Subcommission on Quarternary Stratigraphy, following a recommendation for its adoption by a dedicated working group in 2016¹.

The name is widely recognised as a useful classification of the period in which human activity has created and continues to generate deep and lasting effects on the Earth and its living systems. In particular, it represents the transition from a planetary system which furnishes human beings with natural resources enabling them to flourish, to a system in which human beings drive changes which threaten the planet's ability to support us.

¹ http://guaternary.stratigraphy.org/workinggroups/anthropocene/

Among the many harmful effects on the natural world brought about by human activity are:

Alterations in the Earth's chemical composition

Human activity has changed chemical cycles which determine the distribution of chemicals in land, air, water and natural systems. The most well-known is carbon because of its potentially disastrous effect on climate (see below). In 2016, the amount of carbon dioxide (CO2) in the atmosphere rose permanently above 400 parts per million - its highest permanent level for millions of years and a consequence of human activity, including the burning of fossil fuels and deforestation1.

Cycles for phosphorous and nitrogen are also affected - by industrial practices and their use in fertiliser - leading to consequences such as water eutrophication (depletion of oxygen), effectively killing off some aquatic ecosystems².

Climate change

As a result of greenhouse gas emissions, including CO2 and ozone-depleting substances, climate change is already happening. 2016 was the hottest year since modern records began in 1880. A global temperature rise of at least 1°C is now considered likely by many authorities, while some are predicting changes of two or even three degrees within the next 40 years³. The consequences of climate change include glacial melting, rising sea levels, species extinctions and an increase in severe weather events4.

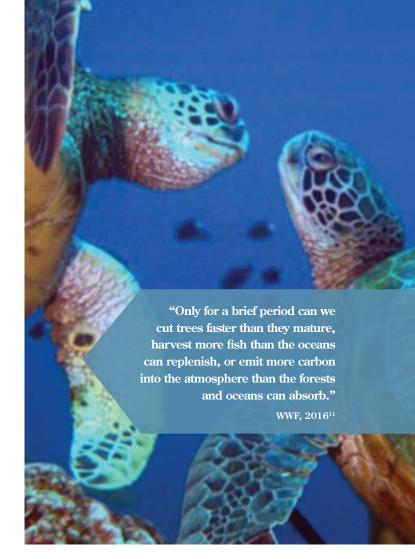
Ocean acidification

One effect of increased atmospheric CO2 is its absorption by the sea, leading to a change in oceanic pH, known as ocean acidification. Consequences of acidification include impairment of marine invertebrate animals' skeletal development, affecting entire food chains. Acidification and global warming also destroy coral reefs, which are vital habitats and ecosystems for marine life5.

Species extinction

Scientists estimate that the current rate of species extinction is at least 100 times greater than it would be without human intervention (some estimates put the rate at 1,000 or even 10,000 times)6. Humanrelated causes include "harvesting", habitat loss or fragmentation, pollution, climate change and humananimal conflict⁷. The extinction of species reflects a massive decline in populations of animals, with a 58% fall in vertebrate populations between 1970 and 2012 (over which period the human population doubled) and a projected decline of 67% by 20208.

All of these changes are taking place at a rate measurable during a single human lifetime, and their effects over one more human lifetime could be catastrophic. Human beings themselves are already suffering the effects of these changes, including through food and water scarcity, soil erosion, climatic events and competition for resources. A recent study found that 750 million people in south Asia have already suffered effects from climate change⁹.



- 2 Yale Environment 360 http://e360.yale.edu/features/how-the-world-passed-a-carbon-threshold-400ppm-and-
- 3 Science Daily https://www.sciencedaily.com/releases/2010/10/101007141106.htm; Worldwatch Institute http:// www.worldwatch.org/node/516
- 4 Intergovernmental Panel on Climate Change http://www.ipcc.ch/ipccreports/tar/wg2/index.php?idp=29 GHG online http://ghgonline.org/predictions.htm; Yale Environment 360 http://e360.yale.edu/features/ how-the-world-passed-a-carbon-threshold-400ppm-and-why-it-matters; Environmental Protection Agency https://19january2017snapshot.epa.gov/climate-change-science/future-climate-change_.html
- 5 NASA https://climate.nasa.gov/effects/; WWF https://www.wwf.org.uk/updates/effects-climate-change 6 Smithsonian Institution Ocean portal http://ocean.si.edu/ocean-acidification
- 7 WWF http://wwf.panda.org/about_our_earth/biodiversity/biodiversity/
- 8 WWF http://wwf.panda.org/what_we_do/endangered_species/
- 9 WWF https://www.worldwildlife.org/pages/living-planet-report-2016 10 India Climate Dialogue
- http://indiaclimatedialogue.net/2017/06/16/climate-impacts-hit-750-million-south-asians-10-years/ 11 WWF https://www.worldwildlife.org/pages/living-planet-report-2016

Population, consumption and the Anthropocene

"The size and scale of the human enterprise have grown exponentially since the mid-20th Century... The future of many living organisms is now in question."

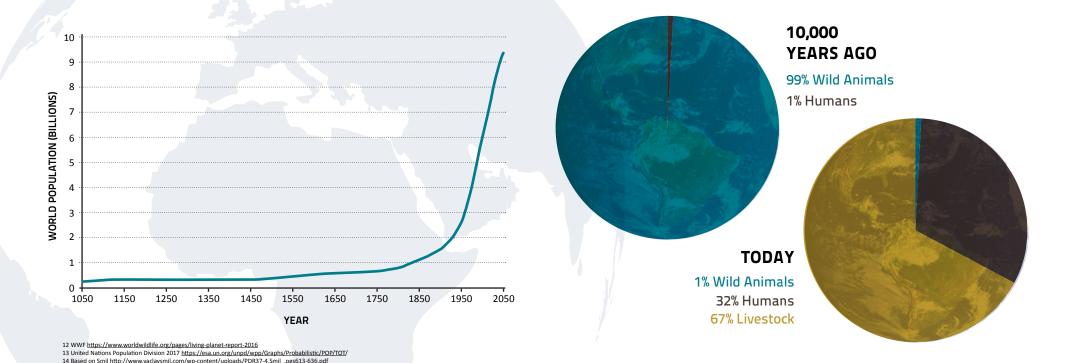
 WWF^{12}

The consensus amongst most advocates for the The scale of humanity's presence and effect can adoption of the Anthropocene is that its start date would be the onset of the Industrial Revolution, 1750/1800. In addition to industrialisation and the development of technology, that period has been marked by exponential growth of the human population, which has multiplied by more than seven times.

In the early 21st century, we are adding an extra billion people to the global population every 12 to 15 years. The UN's median population projection foresees no peak in our growth until the 22nd century, at more than 11 billion people (approximately 50% more than today)¹³ – unless positive action is taken to manage that growth.

be strikingly illustrated by the transition from a world in which wild animals composed the vast majority of the weight of mammals on the land (known as biomass) to one in which they have almost disappeared in statistical terms. When the biomass of domesticated animals is included, based on the best available estimates for 10,000 years ago, wild mammals have gone from being 99% of terrestrial mammal biomass to a little over 1%¹⁴.

Clearly, such numerical transformations are key and indeed fundamental - factors in driving the negative impacts witnessed on a global scale during the Anthropocene.



The impact of consumption The future of the

"Consumption and demography are closely inter-twined. Every person must consume, and each additional person on the planet will add to total consumption levels."

Royal Society, 2012¹⁵

Individual human beings are consumers of natural resources, from food and water to fuels and minerals. We are also all producers of "waste" which the natural environment must process or absorb, such as greenhouse gases, effluent and chemical pollutants. Immense disparities exist between the richest and poorest, with the developed world overwhelmingly responsible for negative impacts globally. Even those who consume and produce the least, however, have a significant, sometimes deeply destructive, impact on their local environments.

The Global Footprint Network assesses humanity's annual demand on the Earth's natural resources and ecosystems, comparing renewable natural resources available (both nationally and globally) with the human demands placed upon them. It has established that since the 1970s, humanity has been in ecological "overshoot", with annual demand on resources exceeding what Earth can regenerate each year. Today, humanity uses the equivalent of 1.7 Earths to provide the resources we use and absorb our waste¹⁶.

Exceeding the Earth's capacity to provide is impossible to sustain.

The future of the natural world in the Anthropocene

The Brookings Institution projects that our current global 'middle class' of 3.2 billion people consuming at a high level in 2016 will rise to roughly 5 billion by 2030¹⁷. The UN estimates that by 2050, we will require 70% more food¹⁸ and the International Energy Agency calculates that the global demand for energy will increase by 30% by 2040¹⁹. Each of these developments and many more, threaten the natural world. The Sixth Mass Extinction is already underway and the pressures on our planet's biodiversity, renewable resources, habitats and species can only multiply as population and consumption increase.

In a world of finite resources, addressing population size and overall consumption is essential to creating a sustainable future in which everyone enjoys secure lives on a healthy planet. The more we are, the less planet there is per person—and per species.

"Ignoring this diagnosis will have major implications for humanity. We can restore the planet's health but only through addressing the root causes, population growth and overconsumption."

Jonathan Baillie, Zoological Society of London²⁰

Informing and empowering people

Whether the term Anthropocene is adopted or not, our age is marked by the fundamental and undeniable impact of human beings on the natural world. The general public, however, still lack clear, accessible information, alerting them to the facts, communicating the urgency of the issues, and making them aware of the positive choices that are available to mitigate the impacts.

Organisations with a mission to inform, educate and stimulate people to think about and appreciate the natural world have a vital role in putting that right.



²⁰ WWF http://www.wwf.org.hk/76840/Rising-consumption-increased-resource-use-by-a-growing-population-puts-unbearable-pressureon-our-Planet-WWF-2012-Living-Planet-Report



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¹⁵ Royal Society https://royalsociety.org/topics-policy/projects/people-planet

¹⁶ Global Footprint Network http://www.footprintnetwork.org/our-work/ecological-footprint/

¹⁷ Brookings Institution https://www.brookings.edu/wp-content/uploads/2017/02/global_20170228_global-middle-class.pdf

¹⁸ UN Food and Agriculture Organisation http://www.fao.org/documents/card/en/c/a2128b09-361c-5468-9d93-2189cc430234/
19 International Energy Agency https://www.iea.org/publications/freepublications/publication/WEO 2014 ES English WEB.pdf