No. 23

Sustainable Blewbury

www.sustainable-blewbury.org.uk

May 2018

For the latest news and more information, please see our website

Sustainable Blewbury news

Annual General Meeting

On 23 April we had a large and lively turnout to hear about and comment on what we've been doing and our future plans – thanks to everyone who came and contributed. We elected Glen Meadows as Chair and Jane Kinniburgh as Secretary. John Ogden continues as Treasurer. Jo Lakeland and Eric Eisenhandler, who were Co-chairs for the past three years, will remain very active as members of the Core Group, along with James Morgan and David Lomas. For a list of our various projects and who to contact go to www.sustainable-blewbury.org.uk/project.htm.

Blewbury Garden Market

Every Saturday, 9.30 to 11.30 am at Blewbury Garage

Our ninth season is off to a flying start!. For the Royal Wedding/FA Cup day we had a huge variety of cakes in addition to our usual selection.

We buy and sell fresh, local garden fruit and veg, flowers, bedding plants and seedlings, home-made bread, cakes and preserves, and (hopefully) local honey and eggs.

Producers please bring items to sell from 9.15 am. For more information and sales forms see: www.sustainable-blewbury.org.uk/food.htm, or email us at bgm@sustainable-blewbury.org.uk.

'Green' drinks

Monday, 4 June, 7.30 pm at The Blueberry

Come to The Blueberry on June 4th to discuss any sustainability or environmental (green) issues that interest you. We'll be there, and look forward to talking about issues close to home or further afield. Or tell us what you think SB should be doing. Everyone is welcome – no set agenda and very informal – just turn up! We plan to try this on the first Monday of every second month.

Repair café by Sustainable Didcot

Sunday, 10 June, 2–5 pm at Didcot Civic Hall

Bring your broken electricals, household items and clothes, blunt tools, and clocks, watches and mechanical items, and fix them with the help of our expert volunteers! Tea, coffee and cake available. See sites.google.com/site/sustainabledidcot/repair-cafe for much more information.

Interesting links

A better approach to carbon capture and storage (CCS)?

The aim of CCS is to capture the carbon dioxide emitted by burning fossil fuels and other processes and to prevent it from entering the atmosphere by storing it underground. Progress on CCS has been painfully slow, and in addition there are serious concerns about storing huge quantities of carbon dioxide long-term without some of it escaping. A new approach, now being tried in Iceland, is the CarbFix Project led by Reykjavik Energy. This stores the carbon dioxide in basalt rock (which is very common) in such a way that the carbon dioxide is converted by natural processes into a solid mineral form – the cylinder shown in the photo. See www.or.is/carbfix for more information.

Bee watch

We have been contacted by some bee keepers who are concerned about the loss of bees due to pesticides. They say:

"Our aim is to improve communication between pesticide users and beekeepers and to allow anyone using pesticides to instantly and easily notify all local beekeepers. The harvesting of swarm is of high importance as it allows beekeepers to replenish colonies they have lost over winter.

"In the Cholsey area, we had 25 hives four months ago, we now have nine. The local beekeeping association lost 50% of their hives in the past few weeks. We don't know why but we know pesticides can have a negative impact. Therefore, we need to increase communication and improve colony loss reporting.

"Check out our website: www.bee.watch, and please pass on this information to anyone you know who may be interested."

Climate change and me

A series of five 15-minute programmes on Radio 4 from 21st to 25th May, now available on iPlayer at www.bbc.co.uk/programmes/b0b4kf6l. Five eminent scientists working in different parts of the world – among them marine biologist Callum Roberts, ecologist Sir John Lawton, geographer Mary Edwards, Jennifer Leaning of Harvard's Center for Health and Human Rights and engineer Richard Dawson, bear witness to the dramatic changes to the world that they have witnessed on the ground and tell how their eyes were opened to global climate change.

What on earth are 'planetary boundaries'?

By Eric Eisenhandler

A new geological epoch: the Anthropocene

Since the most recent ice age ended about 12,000 years ago, we have been living in a geological epoch called the Holocene. Its stable geological and climatic conditions have allowed agriculture, cities and our complex civilisations to develop rapidly. The Industrial Revolution led to an explosive increase in scientific knowledge and technology that has produced huge changes, with many (but not all) people living longer and having easier and better lives.

However, there have been less positive effects. The human population has more than tripled in the past 80 years. Although people disagree on what ultimate level of population would be viable, it is clear that such a rapid increase is not sustainable.

The increase in population and improved standard of living have greatly increased total consumption of food, water and all sorts of natural resources. This has caused huge environmental changes and many significant effects globally, with resources becoming depleted and risks of irreversible damage to the environment.

Climate change and damage to the stratospheric ozone layer are well known, as is the huge increase in the rate of species extinction and the clearance of vast areas of forest. But other serious changes are not much discussed by non-specialists.

In order to recognise that human activity has become the main driver of global environmental change, a new geological epoch has been defined: the Anthropocene.

Planetary boundaries

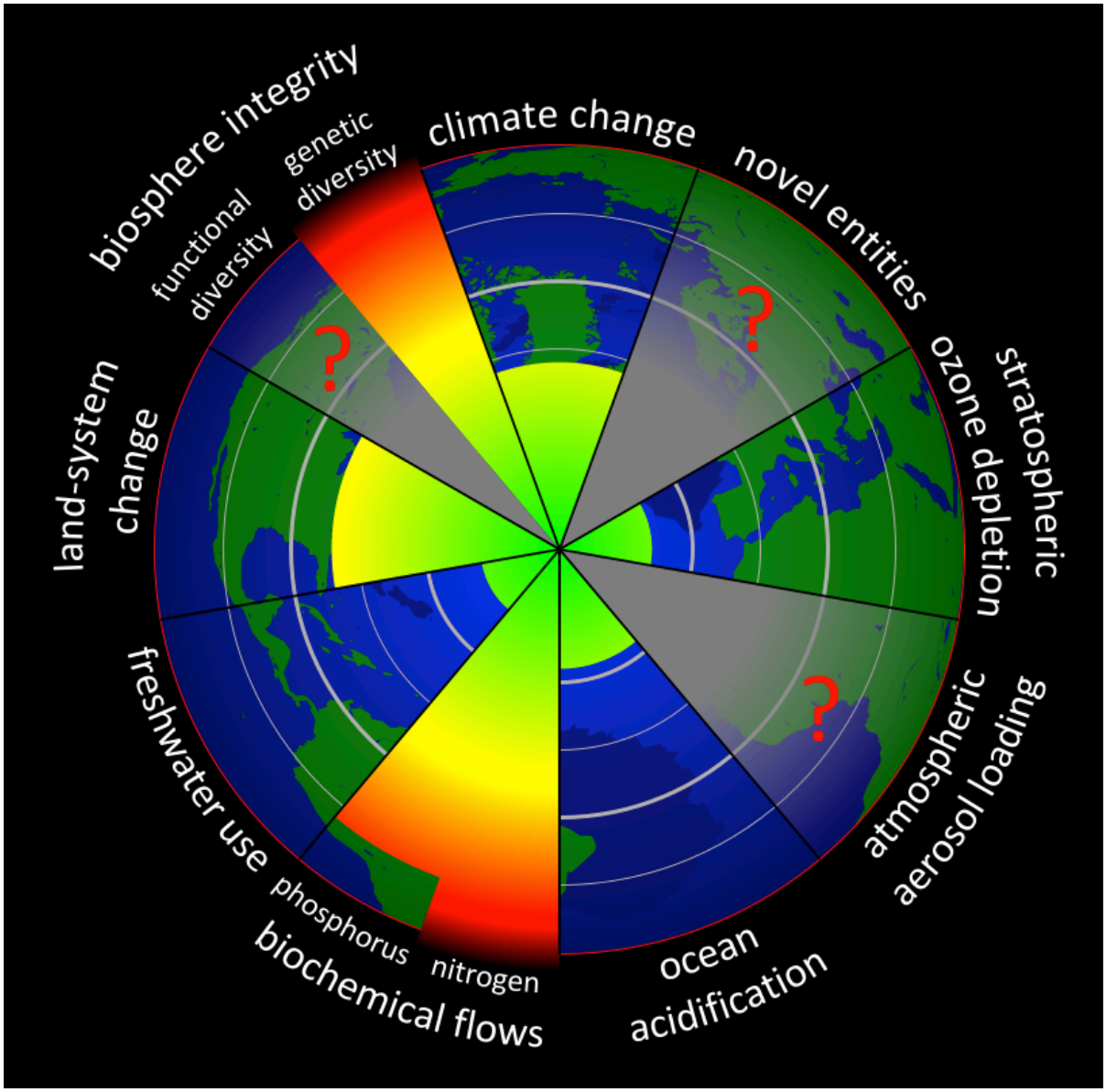
Planetary boundaries were first proposed in 2009 to define what the problem areas are and to try to assess how close each of them might be to causing serious, abrupt and possibly irreversible changes.

The hope is that this will indicate the priority areas and lead to action that could provide a ‘safe operating space for humanity’.

The work has been led by Johan Rockström of the Stockholm Resilience Centre and Will Steffen of the Australian National University. What follows is a short summary of the analysis they and their international collaborators have produced.

Nine planetary boundary areas

Nine main boundary areas are proposed, two of which have sub-areas. For seven of the nine it seems possible to define an approximate threshold at which large and possibly catastrophic changes might occur, as well as how close we are to passing that threshold and entering a danger zone. But for other two areas things are not defined well enough to set a boundary. The nine areas are shown in the diagram and for each of them there is a very brief discussion on where we are now.



Planetary boundaries according to Rockström and Steffen et al. The green areas represent human activities that are within safe margins, the yellow areas represent human activities that may or may not have exceeded safe margins, the red areas represent human activities that have exceeded safe margins, and the grey areas with red question marks represent human activities for which safe margins have not yet been determined.

Climate change

Perhaps the best known and most widely discussed in popular media. The Paris Agreement targets of a rise of 2°C with an aspiration to keep it to 1.5°C do not avoid the problem – they are aimed to avoid

the worst effects. And the pledges made for the Paris Agreement in 2015 will not achieve the target. The pre-industrial level of carbon dioxide in the atmosphere was 280 parts per million (ppm), but it's now about 410 ppm and rising. The level for a 2°C rise is about 450 ppm. Some scientists believe that to avoid very serious effects it must actually be reduced to 350 ppm. The safe boundary is set in the range 350–450 ppm, so **we are now in the danger zone**.

Biodiversity loss

The 'natural' rate of extinctions is very roughly 0.1 to 1 species per million species per year. A level of 10 per year is considered acceptable, but at present it is more than 100 so **the boundary has already been crossed**. A second way to look at biodiversity, shown as a sub-area on the diagram, is to consider families of species and functional diversity. However, a boundary has not yet been defined so there is a question mark on the diagram.

Biochemical flows

This is divided into two sub-areas: nitrogen and phosphorus.

Nitrogen from the atmosphere and phosphorus from mines are converted into various forms, most notably fertilisers. They are washed off farmland and end up in rivers, lakes and the sea, where excess amounts stress aquatic ecosystems.

Nitrogen removed from the atmosphere has increased to about 150 million tonnes per year; the safe threshold is estimated to be 62 million tonnes per year. Phosphorus going into the oceans from human activity is now roughly 22 million tonnes per year; the safe threshold is defined as about 11 million tonnes per year. So **both boundaries have already been crossed.**

Ocean acidification

This is caused by carbon dioxide emissions, so is related to climate change. Surface ocean acidity has increased by about 30%, and this reduces the ability of corals, shellfish and plankton to build shells and skeletons, affecting the entire marine food chain. Rather than pH, the measure chosen is the level of the carbonate mineral aragonite in sea water, which is reduced by acidification. The current level is about 84% of the pre-industrial level and the safe level is considered to be more than 80%, which means that **the boundary has not yet been crossed.**

Land-system change

Increasing amounts of land, including forests and wetlands, are converted for agriculture. This impacts on freshwater and carbon cycles, and reduces biodiversity. About 11.7% of the Earth's land surface is now cropland; the safe limit is considered to be 15%. However, the variable for judging this has been changed to the global area of forest as a percentage of original forest cover – the current value is 62% and the boundary is 75%, so **we are now in the danger zone.**

Freshwater use

Increasing population and improved living standards increase demand and this depletes resources. Freshwater supplies are also affected by climate change via changes in rainfall, melting glaciers and higher temperatures. Usage is now about 2600 km^3 per year; the safe limit is considered to be about 4000 km^3 per year so the **boundary has not yet been crossed.**

Stratospheric ozone depletion

This is an example of success! The ozone layer of the upper atmosphere protects life on Earth by filtering harmful ultraviolet radiation from the sun. In the 1980s scientists discovered that the ozone layer was seriously damaged, with a large hole centred on Antarctica in the southern hemisphere spring, and that it was caused by the release of gases called CFCs that were being used in

refrigeration, air conditioning and as a propellant for aerosol spray cans. A global agreement to ban the use of harmful CFCs was quickly implemented and the ozone hole is now healing slowly. **Assuming that this continues, we are out of danger.**

Atmospheric aerosol loading

This is due to microscopic particles in the atmosphere that affect the climate and living organisms. It Is not easy to define a danger threshold because that depends on what the particles are (e.g. dust, soot from diesel exhaust, etc.) and the aerosols are not spread uniformly (for example pollution from diesels concentrate along urban roads). Some aerosols reflect the sun's visible radiation and cool the Earth, while others contribute to the greenhouse effect and warm it. **Safe boundaries depend on the nature of the aerosol and have not been defined.**

'Novel entities', i.e. unforeseen problems

This is meant to cover unexpected and new sources of pollution of all sorts, from plastic waste to hormone-disrupting drugs and chemicals, and from heavy metals to radioactive contamination. A single threshold can't be defined. **Safe boundaries would depend on the nature of the problem.**

Summary

The planetary boundary concept is not perfect. On its own it can't cover all the issues and factors involved with these very broad problems, and the thresholds it defines can only be approximate. However, planetary boundaries do provide a wakeup call to us about important issues, some of which we have probably never considered. My view is that they are a very useful framework for discussion of these crucial environmental issues.

Going further

Can a good standard of living be compatible with not damaging the planet? An interesting recent study indicates that this would require fundamental changes. Looking at the environmental impact of a large number of countries and comparing with the quality of life reveals that no country achieves this at present. The study needs an article of its own, but you can read a summary (with a link to the main paper) at: bit.ly/2GNKKjl.

References

An accessible Wikipedia description, including background, comments and suggestions:
'Planetary boundaries': en.wikipedia.org/wiki/Planetary_boundaries

A full scientific paper (January 2015): W. Steffen et al., 'Planetary boundaries: Guiding human development on a changing planet': www-ramanathan.ucsd.edu/files/pr210.pdf

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We have a substantial programme of activities in and around the village. Getting involved is fun and can make a very positive contribution to village life and local environment. If you'd like to get involved in what we do, or to receive our free Newsletter, email us at info@sustainable-blewbury.org.uk or phone John Ogden at 01235 850372.