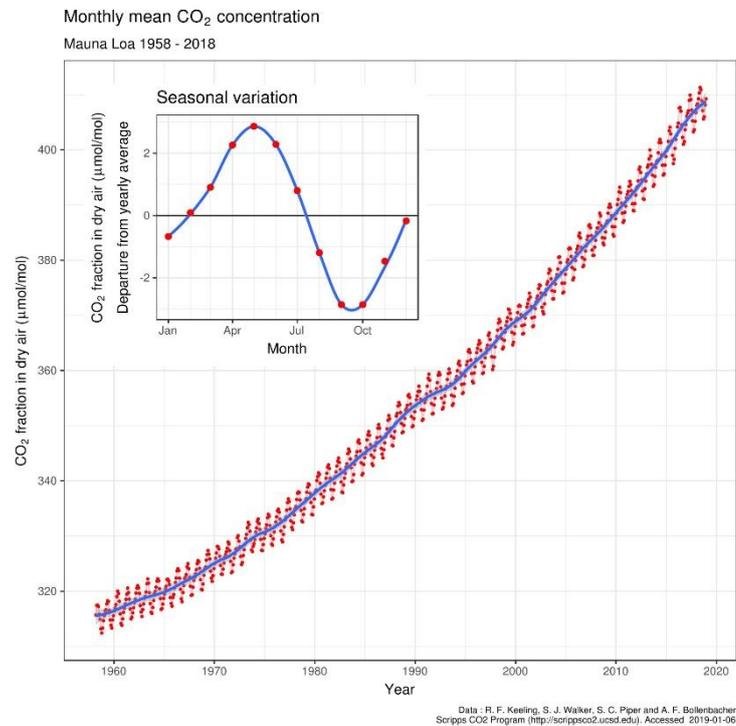


The Climate Crisis

by Mark Adams

The climate crisis that we currently face is man-made, resulting primarily from the burning of fossil fuels (coal, oil and gas) starting with the industrial revolution in the 18th and 19th centuries.

One of NASA's chief scientists, James Hansen, testified to the American Congress in 1988 that scientific data confirmed the role of humans in climate change. Since then there has been a concerted effort by the fossil fuel industry to cast doubt on climate change science supporting this view. So, whereas in the scientific community the idea that the current period of global heating is anthropogenic in nature has been accepted since the 1990's, it has taken until now, some 30 years later, for it to be accepted by the general public. This delay will unfortunately have consequences.



CO₂ levels measured at Mauna Loa - The Keeling Curve

The driving forces for this years' dramatic change in the public view are probably David Attenborough's programmes on the BBC, Greta Thunberg's protests outside the Swedish parliament and the Extinction Rebellion protests in London. That and the regular reports of extreme weather events and new temperature records being set on an almost monthly basis of course.

Global Heating and Climate Change

There is a direct link between the concentration of carbon dioxide (CO₂) in the atmosphere and global temperatures. This fact has been known for centuries. Increasing levels of CO₂ due to fossil fuel emissions have led to a global heating of about 1°C since the late nineteenth century – most of which has occurred in the last 35 years. With global heating of this scale comes climate change - a broad range of global phenomena such as sea level rise; ice mass loss in Greenland, Antarctica, the Arctic and mountain glaciers worldwide; shifts in flower/plant blooming times; and the increase in number and severity of extreme weather events such as floods, droughts, hurricanes and heat-waves.

The current CO₂ level (410 parts per million) is the highest it has been in at least 2.5 million years. The average global temperature back then was 2-3 degrees hotter than now. Since the 1950's the CO₂ levels have been continuously monitored at the Mauna Loa observatory in Hawaii. A recent download of the data is shown in figure 1. There is a seasonal variation due to plant photosynthesis in the Northern hemisphere but apart from that it's continually increasing and,

very importantly, it's curving upwards indicating that it's accelerating. It is very likely that we will be unable to limit the global temperature rise (relative to the pre-industrial age) to the "safe" value of 1.5°C.



Retreat of the Pasterze glacier in the Grossglockner range near Heiligenblut - Photo ÖAV

What can we do?

The article in this newsletter by Irene Auerbach describes the effect global heating is having on the mountain environment in Austria. The landscape is changing dramatically (fig. 2) and it's having an effect on ÖAV activities (see fig. 3). It's appropriate therefore, as the UK section of the ÖAV, that we acknowledge the existence of anthropogenic global heating and think about ways in which, at both Club and individual level, we can modify our environmental impact in order to help solve this problem.

As individuals the main mantra to remember is *reduce* (emissions and consumption), *repair* (avoid replacing), *re-use* (for some other purpose) and *recycle* (dispose of properly). I'll focus on the first of these. We MUST reduce our CO₂ emissions. To do this we firstly need to work out what our current CO₂ emissions are and where we can cut back. On-line calculators exist to help with this, e.g. <https://www.carbonfootprint.com/calculator.aspx>. This site is also a good source of tips for reducing your environmental impact. The main areas to focus on are: travel (particularly flights and car transportation), domestic heating and meat consumption (particularly beef).

It's unlikely that we will be able to reduce our CO₂ footprint to zero just by cutting back so consider carbon offsetting. There are a number of schemes in existence – just be careful that they conform to one or more of the following standards : Verified Carbon Standard (VCS), Gold Standard Voluntary Emission Reductions (VER) and Certified Emission Reductions (CER).

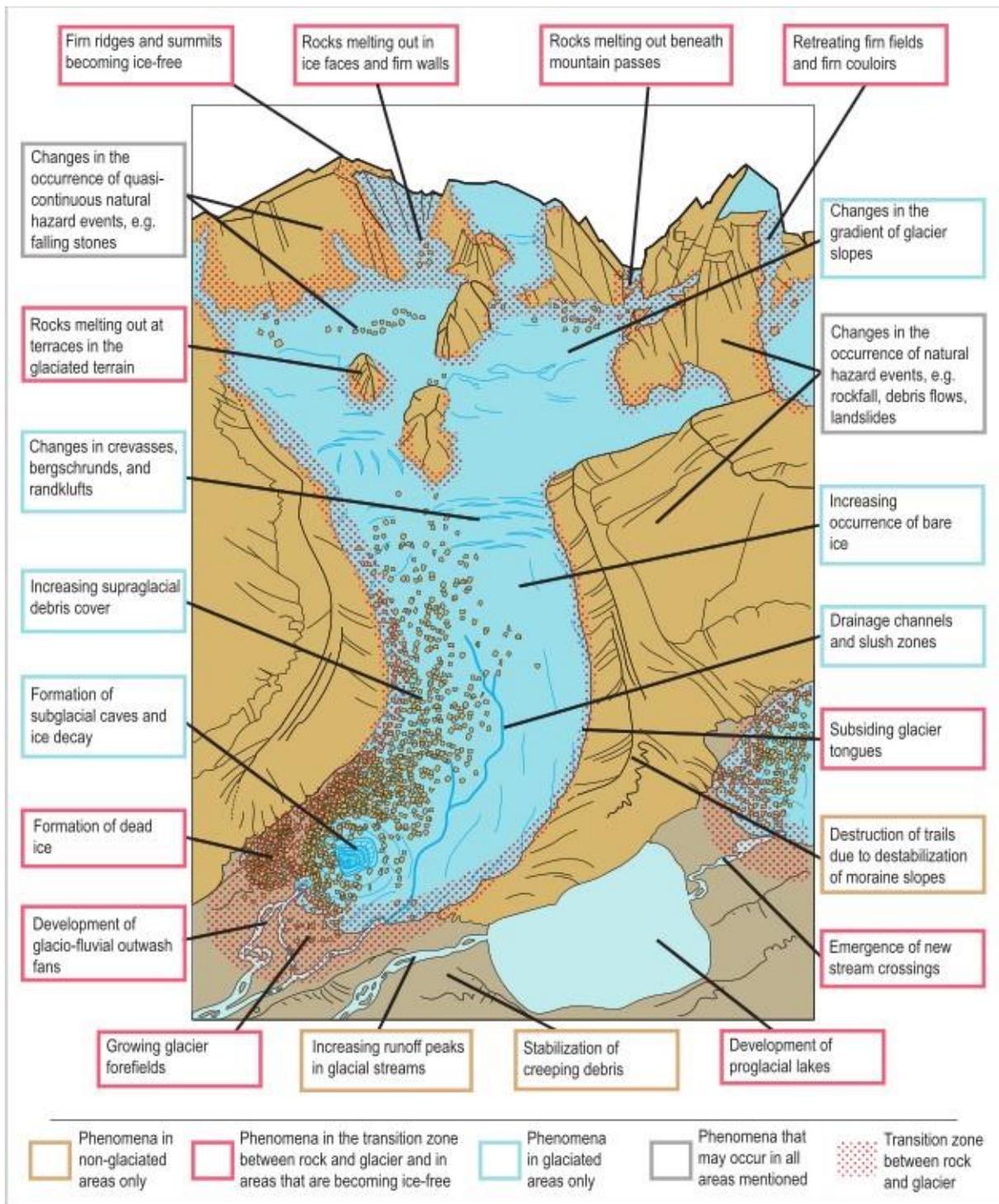
At the Club level we need to examine our activities to see where CO₂ emission savings can be made and help the membership by providing information and guidance to enable them to make their contribution. We are currently looking into carbon offsetting schemes, for example. A more prescriptive approach with regard to travel and carbon offsetting may be envisaged for some Club activities.

What about scientific and technological solutions?

Globally we have to reduce CO₂ emissions to net zero and beyond. At some point soon, in order to keep the temperature rise below even 3°C (corresponding to CO₂ levels of 400-450 ppm), we have to start removing CO₂ from the atmosphere. Reducing global emissions requires a shift from fossil fuels to both renewable energy sources (solar, wind, tidal etc) and nuclear (perhaps fusion rather than fission). This will require a concerted effort and agreement of all the world's governments. This appears difficult to achieve at the moment but people are working really hard to make it happen. It is important to help them by keeping up the pressure on our own government through direct action and protest. Removing CO₂ from the atmosphere (and the oceans) is a major engineering challenge but not impossible. A variety of solutions have been proposed and are currently being developed. Some people are concerned that by offering this as a solution it will prevent the emission reduction strategy from being properly adopted but it's difficult to see how we can limit temperature rises to safe levels without removing CO₂ from the atmosphere in very large quantities. Just reducing our emissions will not be enough.

Do we have a future?

Some in the scientific community believe that we have already passed the point of no return - the tipping point - and significant increases in temperature are already hard-wired in with various feedback mechanisms exacerbating the problem. "There's nothing we can do about it and it's pointless trying." I'm a bit more optimistic than this – but for a slightly negative reason. One of the problems in getting the general public to take notice of this problem has been the use of the year 2100 as a baseline point when scientists discuss global heating i.e. the “if we don't do something about it then in 2100 it will be like this” kind of approach. For most people this is simply too far away to be concerned about. Day-to-day life is hard enough as it is without worrying about something that will happen long after they're gone. Unfortunately – or maybe fortunately - it's all happening much faster than predicted. The dramatic and extreme weather events like the recent heatwave in mainland Europe are happening now, in our lifetimes, not the lifetimes of our descendants. This will naturally tend to focus the mind a bit and for this reason I think we're much more likely to do something about it. We will get through the climate crisis.



Increasing mountaineering hazards due to climate change. Image from 'Impacts of Global Warming on Mountaineering: A Classification of Phenomena Affecting the Alpine Trial Network. Florian Ritter, Markus Fiebig, and Andreas Muhar, Mountain Research and Development, 32(1): 4-15'