A Review of Global Climate Management

Dr. Alan K. Betts

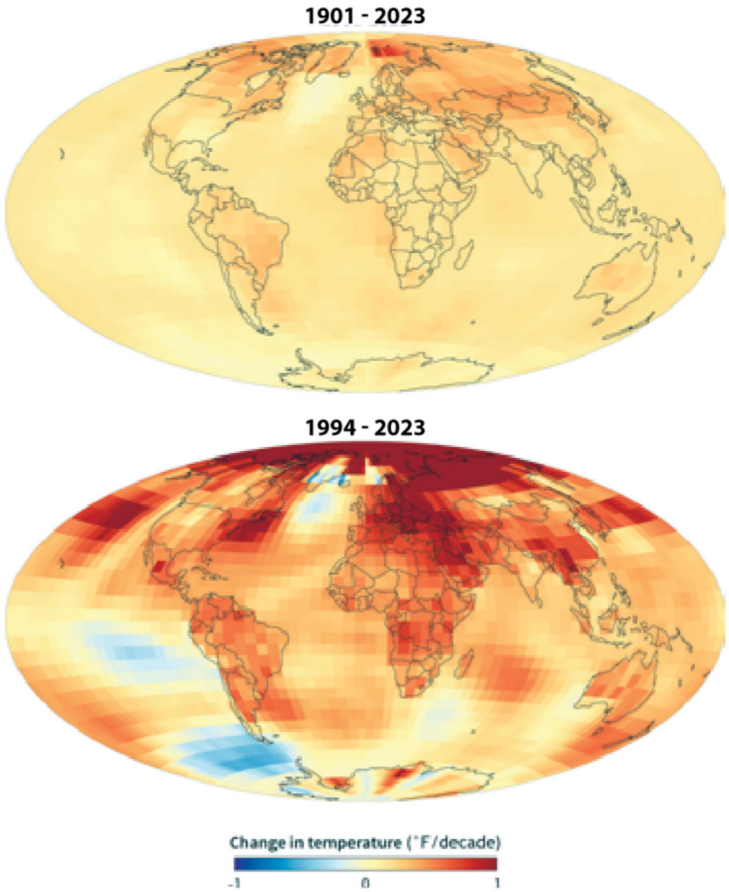
The global climate situation has become very challenging as Mother Nature has taken over to save life on Earth in the face of the planned criminal destruction by the fossil fuel industry to maximize its profits. I have discussed this in earlier articles.

Last year and this past winter, there have been new record temperatures both globally and in the U.S. In our *G.E.T.* region, we have had very little snow in Vermont except in the mountains, but as I write on March 11, it has been snowing all night, and it is hard to shovel the four inches off my road, so I am just watching out my window!

There has been a stunning change at the World Meteorological Organization (WMO) international level that was a delightful and exciting surprise to me. The WMO has appointed Dr. Gianpaulo Balsamo as the director of the WMO Global Greenhouse Gas Watch (G3W). I know Gianpaulo very well as for many years he has been the Director of the European Weather Center for Medium-Range Weather Forecasts (ECMWF) in the UK, our finest global modeling center. We worked together on improving the ECMWF model by comparing it with detailed diurnal and seasonal analyses of 50 years of calibrated hourly Canadian Prairie data. The appointment of an expert scientist in coupled processes in Earth System Modelling will provide a solid scientific basis to assess mitigation actions taken under the Paris Agreement on climate change. He commented as follows.

"The year 2023 was the warmest year on record, with super-charged extreme weather events. Finding climate change solutions is the defining challenge of our time, and this includes the need for better information on greenhouse gases – the root cause," said Dr Gianpaolo Balsamo, the new director of the Global Greenhouse Gas Watch (G3W). The 2024-2027 G3W draft implementation plan lays down the foundational blocks for building an integrated, operational framework which brings under one roof all space-based and surface-based observing systems, as well as modelling and data assimilation capabilities. The G3W plan will monitor carbon dioxide, which has a long lifetime and accounts for nearly two thirds of the warming effect of long-lived greenhouse gases; methane, which is a potent climate change agent but has a lifespan of only about one decade, and nitrous oxide which is an extremely potent climate change and ozone depleting agent."

WARMING OVER PAST 30 YEARS IS MUCH FASTER THAN LONG-TERM TREND



Trends in annual surface temperature in the past few decades (1994-2023, bottom) compared to the trend since the start of the 20th century (1901-2023, top). Recent warming is much faster than the longer-term average, with some locations warming by 1°F or more per decade. Differences are most dramatic in the Arctic, where the loss of reflective ice and snow amplifies the rate of warming. (NOAA Climate.gov, based on data provided by NOAA National Centers for Environmental Information)

This is a flagship initiative to boost climate action at the global level as it will improve global scientific collaboration. For contrast, scientific reports to the recent COP28 meeting made it clear that the globe is still heading in the wrong direction but with more than 500 fossil fuel lobbyists present, they could be ignored.

The statistics for 2023 remove any doubt as to where we are headed. 2023 was the warmest year on record, because of long-term climate change and the effect of the 2023 and 2024 El Niño episode. Globally, all the months from July to December were the warmest on record by stunning margins above 0.3°C. All the years since 1976 have been warmer than the 20th century average. In addition, 2023 was also a year when Antarctic Sea ice coverage hit a record low.

Global sea level increased to a new high in 2023. Since the beginning of the satellite altimetry measurement in 1993, sea level has increased by 110mm (4.3 in). The oceans absorb more than 90% of anthropogenic heat in the Earth system, so they play a role in moderating global atmospheric warming. The heat content of the oceans has been increasing steadily for several decades. Measurements have become much more precise since the Argo float program was introduced in 2005, so we can see that recent ocean warming is at a steadily increasing rate.

The threshold outlined in the 2015 Paris Agreement of keeping the temperature rise to 1.5°C (above Industrial Revolution temperatures) has essentially been reached and warmer temperatures lie ahead. The key reason, of course, is that politicians in the U.S. have been heavily influenced by the fossil fuel industry since 1978 not to bring the climate catastrophe under control.

Readers understand the many things we can do locally to improve our resilience to accelerating climate change. My expectation is that this shift at the WMO will give us a responsible global grasp that is outside political interference.

Dr. Alan Betts of Atmospheric Research in Pittsford, VT is a climate scientist. Read more at alanbetts.com. ♻

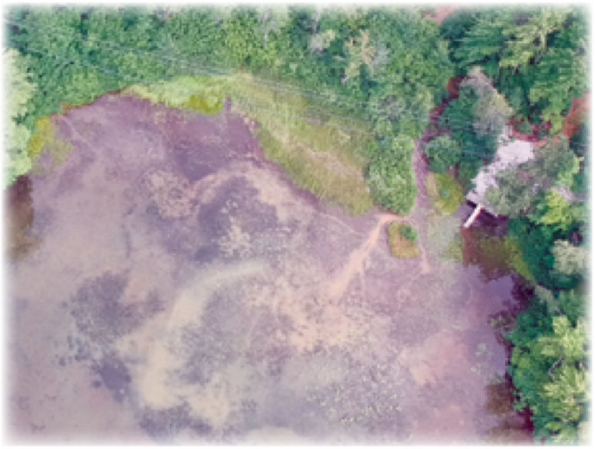
Ponds, Lakes and Rivers: Other Casualties of Climate Change

Russ Lanoie

One of the biggest environment threats to ponds, lakes and rivers comes from erosion of natural soils in developed areas. Unpaved roads, road shoulders, driveways, roof drip lines, construction and logging areas are subject to the erosive power of rain. As the late Tin Mountain Executive Director and forest ecologist Dr. Michael Cline in Albany, New Hampshire often pointed out, "All that soil-laden water ends up somewhere; too often it silts streams destroying fish breeding beds and adding phosphorus into nearby lakes contributing to algal blooms."

Our recent rain events seem to be more intense on a regular basis regardless of whether you blame global climate change or not. There have been several events just this past year that have caused damage that is still being repaired. But the soil that has been washed away is just beginning to cause problems that will be even harder to repair than the obvious washouts left behind. There are increased reports of swimming areas being jeopardized with dangerous contaminants, and sometimes the threat is even visible to the naked eye, as in the photo of a pond near my home in Madison, NH.

This is the pond where I used to swim with my kids, and where I now often launch my kayak. For the last ten years, I have had the dubious task of trying to maintain the very basic unpaved roads in the burgeoning housing development included in the watershed uphill from the pond that drains directly into it. Fortunately, the pond is still mostly clear in spite of this siltation, so local residents have formed an association to protect it from further degradation. I am pleased to be a consultant to the association, offering what I have learned in the last sixty years of driveway and road maintenance. In addition to providing proper ongoing maintenance, their upcoming stormwater migration program will likely involve stone lining ditches and installing check dams and settling ponds, in part just to deal with the excessive amount of winter traction sand spread on the development's steep roads.



A pond near the author's home shows signs of siltation but is still mostly clear due to a stormwater migration program. (Bob Christiansen)

While it will never be possible to control the weather in New England, it is possible to stabilize roads

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