

Text from different sources

2021-08-19

Text A

Recently, the U.K. Met Office announced a revision to the Hadley Center historical analysis of sea surface temperatures (SST), suggesting that the oceans have warmed about 0.1 degree Celsius more than previously thought. The need for revision arises from the long-recognized problem that in the past sea surface temperatures were measured using a variety of error-prone methods such as using open buckets, lamb's wool-wrapped thermometers, and canvas bags. It was not until the 1990s that oceanographers developed a network of consistent and reliable measurement buoys.

Text B

In high-latitude regions of Earth, temperatures have risen 0.6 uC per decade over the last 30 years, twice as fast as the global average (Stocker 2013). This is causing normally frozen ground to thaw (Brown 2008, Romanovsky 2009), exposing substantial quantities of organic carbon to decomposition by soil microbes. This permafrost carbon is the remnant of plants and animals accumulated in perennially frozen soil over thousands of years, and the permafrost region contains twice as much carbon as there is currently in the atmosphere (Romanovsky 2013, Zimov 2006)

Text C

Sowing and reaping: It's at the core of human society. In ancient times, agriculture helped make the first great civilizations possible. Now, with the help of modern machinery and fertilizers, farm yields are so high that we produce more than enough food to feed everyone on the planet. Yet, hunger remains stubborn. Malnutrition is growing in some parts of the world. And, the planet's land and water resources are so poorly used, according to a new United Nations report, that, as climate change puts ever-greater pressure on agriculture, the ability of humanity to feed itself is in peril.

Text D

A landmark report issued by the United Nations' scientific panel on climate change has delivered one of the most dire public warnings to date about the impending crisis from climate change. In it, the Intergovernmental Panel on Climate Change "describes a world of worsening food shortages and wildfires, and a mass die-off of coral reefs," according to The New York Times—and this world could become our reality as soon as 2040. That leaves just a few years for every government on the globe to drastically reduce its carbon output, requiring coordination that is historically unprecedented as well as politically unlikely, especially in the United States under President Donald Trump.

Text E

Managing the 1.5 degree target is challenging to say the least, but still reachable if we start doing things differently today from yesterday. According to calculations that we have done based on a few studies, in practice, all of us will have to keep a yearly “carbon dioxide budget” and emit maximally 5 tonnes greenhouse gases by the year 2020 (excluding public consumption). Currently, the average Swede emits nearly 9 tonnes greenhouse gases per year (excluding public consumption). The global average is 6 tonnes greenhouse gases every year.

Text F

Satellite altimeter data collected since 1993 have measured a rise in global mean sea level (GMSL) of $\sim 3 \pm 0.4$ mm/y (Nerem 2010, Ablain 2017), resulting in more than 7 cm of total sea-level rise over the last 25 y. This rate of sea-level rise is expected to accelerate as the melting of the ice sheets and ocean heat content increases as greenhouse gas concentrations rise. Acceleration of sea-level rise over the 20th century has already been inferred from tide-gauge data (Church 2006, Merrifield 2010, Dangendorf 2017), although sampling and data issues preclude a precise quantification. The satellite altimeter record of sea-level change from TOPEX/Poseidon, Jason-1, Jason-2, and Jason-3 is now approaching 25 y in length, making it possible to begin probing the record for climate-change-driven acceleration of the rate of GMSL change (Chen 2017).

Text G

Periodically, we receive queries asking if Earth is cooling. Although multiple lines of converging scientific evidence show conclusively that our climate is warming, stories sometimes appear in the media calling that into question. New studies are interpreted as contradicting previous research, or data are viewed to be in conflict with established scientific thinking.

Last spring, for example, a number of media outlets and websites reported on a story that looked at data acquired from NASA’s Goddard Institute for Space Studies (GISS) Surface Temperature Analysis (GIS-TEMP), which estimates changes in global surface temperature. The article discussed a short-term cooling period that showed up in the data in 2017 and 2018 and correctly stated that short-term cooling cycles are “statistical noise compared to the long-term trend.”

Text H

The threat to coral reefs from climate change is starker than previously thought, with ocean heatwaves killing them far more quickly than had been realised, research suggests.

It was already known that water temperatures 1-2C higher than the long-term summer average can lead to coral bleaching, where coral polyps expel the colourful algae that live inside their tissues. The breakdown of the symbiotic relationship between the coral animal and the algae that supplies almost all its food causes reefs to turn a ghostly white colour and can lead to death if the relationship is not restored.

The research shows that damage from ocean heatwaves — rapid rises in water temperatures similar to heatwaves on land — goes deeper.

Text I

It’s been some time since I wrote anything for RealClimate. In the interim there’s been a lot of important new work in the area of my primary research interest - Antarctica. Much of it is aimed at addressing the

central question in Antarctic glaciology: How much ice is going to be lost from the West Antarctic ice sheet, and how soon? There's been a nearly continuous stream of evidence supporting the view that the West Antarctic Ice Sheet is in serious trouble - perhaps already undergoing the beginning of "collapse", which John Mercer presaged more than four decades ago.

Text J

The West Antarctic Ice Sheet (WAIS) has been losing ice throughout the satellite record, currently at a rate equivalent to global sea-level rise of ~ 4.5 cm century⁻¹ (2012–2017 average) (Shepherd 2018). This ice loss is known to be driven by changes in ocean melting of ice shelves (Shepherd 2004), but it remains unclear whether these changes can be attributed to contemporary climate change. The rate of ice loss shows large variations (Mouginot 2013, Konrad 2017) driven by decadal variability in oceanic conditions (Jenkins 2016, Jenkins 2018).

Text K

July was officially the hottest month ever measured by humans on Earth, it has been confirmed.

Meteorologists had earlier released preliminary data suggesting the record had been broken, leading to warnings about the urgency required to mitigate the effects of the climate crisis.

But the US National Oceanic and Atmospheric Administration announced on Thursday that July was 0.95C warmer than the 20th century average for the month and had narrowly topped the previous record set in 2016, by 0.03C.

Temperatures have been recorded every year since 1880. July 2019 was about 1.2C warmer than the pre-industrial era, according to the data.

Scientists have said the upward trend will probably continue because of human activity on the planet.

Text L

Researchers led by Princeton University examined a range of possible climate-related impacts on the ocean to predict when these impacts are likely to occur. Some impacts – such as sea temperature rise and acidification – have already begun while others, like changes to microbial productivity, which serves as the basis of the marine food web, will happen over the next century. Images from NASA EarthData show ocean color, an indicator of microbial productivity. Credit NASA

Sea temperature and ocean acidification have climbed during the last three decades to levels beyond what is expected due to natural variation alone, a new study led by Princeton researchers finds. Meanwhile other impacts from climate change, such as changes in the activity of ocean microbes that regulate the Earth's carbon and oxygen cycles, will take several more decades to a century to appear. The report was published Aug. 19 online in the journal Nature Climate Change.

Text M

Droughts linked to climate change are going to hit vulnerable populations the hardest, especially communities in war-torn countries such as Yemen and South Sudan, according to a new study.

The study published yesterday in the Proceedings of the National Academy of Sciences said children in developing countries will be particularly at risk. It found that increased climate shocks could slow or even reverse years of progress in lowering rates of stunting caused by poor childhood nutrition.

About 1 in 9 people are currently undernourished worldwide, and poor nutrition is to blame for nearly half of the deaths of children younger than 5. This issue is expected to get worse as temperatures rise and droughts become more frequent due to climate change. Lead author Matthew Cooper, a doctoral student at the University of Maryland, said that these children will suffer despite having not contributed to climate change themselves.

Text N

You don't need a groundhog to predict when spring will come next year. Scientists say it'll arrive sooner than ever—but there's a pretty big catch.

NBC News reports that researchers at the University of Wisconsin say climate change will lead to an earlier spring, year after year, indefinitely. Spring plants have started popping up earlier and earlier over the past several decades, in every region of the country. That means that winter's misery is getting shorter and shorter, too. In 100 years, spring may arrive as much as three weeks earlier.

But there's a serious dark side to the shortened winter, and it could decimate the lovely flowers we've come to associate with spring. In areas like the Midwest and Plains states, the weather change could cause "false springs," quick bursts of warm weather that cause plants to start blooming, and then quickly fade back to freezing, stunting the plants' growth. It could also create a mismatch between when plants are available and when the animals that need them to survive are around.

Text O

For such a fractious discipline, there has been remarkable agreement among economists concerning the first-best climate policy. Ever since the writings of Nordhaus (1977), d'Arge (1979), and Schelling (1992), it has been widely accepted that climate change is, on balance, a negative externality and that greenhouse gas (GHG) emissions should be priced, preferably taxed. Although there continues to be a vigorous debate about climate targets in the long-term (Stern et al. 2006; Nordhaus 2013), most economists agree that a sensible climate policy starts modestly and then accelerates (Wigley, Richels, and Edmonds 1996; Goulder and Mathai 2000).

Text P

When we think about climate change, we think of catastrophe: flooded coastal cities, prolonged droughts, uncontrollable wildfires. But the changing climate is also affecting us in subtler ways, as with the challenge it poses to outdoor winter recreation. In places like Brantford, that means the erosion of a proud outdoor-rink culture. But it's also the snow-sports industry and ski towns, forced to adapt to less snowpack; the Iditarod, rerouting in search of snow; ice fishermen, kept off ponds by unsafe conditions.

Winter sports, unlike the glaciers of Glacier National Park or ash trees of the Northeast, aren't going away anytime soon. The NHL plays its games in climate-controlled arenas, and competitive skiing often relies on artificial snow. But as climate change forces communities like Brantford to consider forfeiting their beloved winter pastimes, we'll have to reckon with an existential question: What will we lose if we can't play sports where they're meant to be played?

Text Q

Switching to a plant-based diet could be one of the most crucial ways we can collectively tackle climate change, a United Nations report is expected to say.

By eating less meat, it could save millions of square miles of land from being degraded by farming, the report will state.

Cutting food waste and encouraging more sustainable farming are also listed as some of the key ways we can protect the planet.

The report is being finalised this week among scientists and government officials on the UN's Intergovernmental Panel on Climate Change (IPCC). The panel focuses on the role land can play in tackling global warming and the impact rising temperatures have on farmland and habitats.