Is Al Gore's An Inconvenient Truth accurate?

What The Science Says:
Al Gore's film was "broadly accurate" according to an expert witness called when an attempt was made through the courts to prevent the film being shown in schools.

Climate Myth: Al Gore got it wrong
"Al Gore's Oscar-winning documentary on global warming, An Inconvenient Truth, was [...] criticised by a high court judge who highlighted what he said were "nine scientific errors" in the film.

Mr Justice Barton yesterday said that while the film was "broadly accurate" in its presentation of climate change, he identified nine significant errors in the film, some of which, he said, had arisen in "the context of alarmism and exaggeration" to support the former US vice-president's views on climate change." (The Guardian)

At a glance

An Inconvenient Truth is an award-winning documentary-style film that was released in September 2006, featuring the former U.S. Vice-president Al Gore. All about climate change, it was loved by many but vociferously loathed by some.

The film did contain a few errors, but that's not surprising given it was about climate science but created by a well-meaning politician. In reality, the reaction to it in certain quarters did a great deal to expose the simplistic mindset of the climate science denier. In their world, any error, however small, invalidates our entire understanding of how the planet works. It's like saying that because a single doctor misdiagnoses a condition, medicine should be abolished in its entirety.

Where were the errors? The most widely-circulated one involved snow and ice on Africa's highest mountain, Kilimanjaro (5,895 metres). At that height, even by the Equator, the temperatures around the summit rarely go above freezing. The error was in the claim that climate change had caused the shrinking of Kilimanjaro's ice-cap.

Comparing Kilimanjaro today to when the first explorers scaled it over 100 years ago shows that glacial retreat has certainly removed its ice-sheets by some 90%. The ice has however sublimed - gone from solid to vapour - something that often happens in the very dry cold air that is typical of the local high-altitude climate there. In the rainy seasons that occur there twice a year, snow does fall, sometimes copiously, but the sublimation process is in overall charge at present.

But that's a minor error when one considers all of the vast numbers of retreating mountain glaciers in the mid-latitudes and the huge meltwater torrents gushing from their ends. That those glaciers are retreating due to the warming climate is widely accepted by those who study them.

Other errors concerned timing of future changes, giving an impression of imminent chaos. But does that matter? Not really. If you know the oceans are going to rise by several metres, whether that takes 50, 100 or 200 years is something of a distraction. We know from the deglaciation after the last ice-age that under some circumstances, sea level can rise by around four metres per century. So we have a feel for what's possible if warming continues unchecked. Even if the seas rise by a tenth of that figure by 2100, it's still seriously bad news.

In other words, we're storing up massive problems for our children, grandchildren and their descendents. To ignore that because a politician once annoyed you is to casually write off their futures. Is that the best we

can do?

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Further details

Al Gore, certainly one of the most vilified proponents of climate science anywhere in the world, earned most of this enmity through the success of a film he presented called *An Inconvenient Truth* (2006), hereafter AIT. The film was a staid presentation of climate science to date, a round-up of research, science and projections, with many cinematic sequences employed to harness the power of the medium. It was meant to shock, because those of us who fully understand what's going on with the climate find it shocking that we're allowing this to happen to our beloved Earth.

The majority of the film, covering issues like Himalayan Glaciers, Greenland and Antarctica losing ice, the severity of hurricanes and other weather phenomena, was accurate and represented the science as it stood. Since the release of the film, considerably more evidence has been found in support of the science and projections in the film.

One erroneous claim by Gore was to infer that global warming had caused the shrinking of the ice-sheets around the summit of Mount Kilimanjaro. Glaciologists who study the mountain instead consider the massive (90%) ice-loss on its heights to be predominantly caused by sublimation in the very cold and dry air, frequent windy conditions and high incident UV light at that altitude (Kaser et al. 2004), together with insufficient snowfall to keep the ice topped-up (fig. 1). A good explanation of the phenomenon is available in a 2007 article published in American Scientist, by Philip Mote and Georg Kaser (PDF available at the time of writing at Researchgate).

Fig. 1: the distinctively fluted ice-cliffs high on Kilimanjaro. Ice-ablation here predominantly occurs due to its sublimation into the dry, cold air with high incident UV light - unlike most mountain glaciers around the world. Image: James Heilman via Wikipedia, licensed under Creative Commons Attribution-Share Alike 3.0 Unported licence.

The pattern of deglaciation on Kilimanjaro, still ongoing, differs from that of the numerous mid-latitude mountain glaciers around the world, that are without doubt mostly retreating due to ice-melt in a warmer climate. In addition, a lot of the Kilimanjaro ice-loss occurred well before the steepening in global warming after the 1970s. In that respect, Kilimanjaro is a bit special. Unfortunately it's also an iconic mountain, which is probably why Gore picked it. An error, but an understandable one for a politician to make.

If Gore had asked, he would likely have been advised to turn his attention to some other iconic mountains, such as the well known European Alpine peaks, the Matterhorn and Mt Blanc. Warming has been problematic in the Alps for years now and is getting worse: in the hot, dry summer of 2022, both of these and some other peaks saw huts closed down and mountain guides cancelling bookings. The main risk was

rockfall due to the permafrost that "glues" the rock together melting away. The story was covered widely in the media, including a good objective account at the UK Climbing news website here.

Many of the other errors were of a more political theme. Most involved sea level rise which as readers will know is a slow process: currently the rate is around 3.6 millimetres per year but it is accelerating. Gore showed slides of some of those typical flood-maps that depict the effects of different amounts of sea level rise and kind of implied these inundations could happen very soon. That's straying into politics in that Gore realised he had to shock to get the message across.

Nevertheless, 3.6mm a year equates to 36 centimetres a century and that is the bare minimum that can be expected because of that acceleration. We know what's possible from looking at the past: for example in Meltwater Pulse 1A, some 14,600 years ago, sea levels are widely considered to have risen by 20 metres in just 500 years (Lin et al. 2021).

Once processes such as ice-sheet collapse get underway, they are near-impossible to stop. That means that having beach-front property at the moment (something Gore is often accused of) should be fine unless a big hurricane makes landfall in your neighbourhood (bad luck). But it would be inadvisable to consider such a residence as a long-term, intergenerational investment to be enjoyed for centuries. For many parts of the world, assuming for a moment that we fail to curb emissions, sea level rise only becomes a massive problem over the decades and centuries to come: nevertheless it is an appalling legacy to leave to future generations.

Skeptical Science explains the science of global warming and examines climate misinformation through the lens of peer-reviewed research. The website won the Australian Museum 2011 Eureka Prize for the Advancement of Climate Change Knowledge. Members of the Skeptical Science team have authored peer-reviewed papers, a college textbook on climate change and the book Climate Change Denial: Heads in the Sand. Skeptical Science content has been used in university courses, textbooks, government reports on climate change, television documentaries and numerous books.