

# Some climate myths as published in a local newspaper

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## Abstract

Readers of my small-town newspaper, The Delaware Gazette, have written letters expressing for themselves (or repeating) climate myths. This talk will delineate some of the myths and the explanations I have written in response and provide a list of the myths addressed so far.

**Keywords:** Climate science, antiscience, popular beliefs.

## Resumen

Los lectores del periódico de mi pequeño pueblo, La Gaceta de Delaware, han escrito cartas que expresan por sí mismos (o repiten) mitos climáticos. Este artículo delimitará algunos de los mitos y explicaciones que he escrito en el restablecimiento de respuestas y proporciono una lista de dichos mitos publicados ahí hasta el momento.

**Palabras clave:** Ciencia del clima, creencias populares, anticiencia.

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## I. INTRODUCTION

The myths discussed in this paper are all (but one) taken from letters to the editor of the Delaware Gazette, my hometown newspaper. They represent some of the most prevalent themes suggested by denialists. The reason they appear in this tiny paper is because of the ubiquity of internet craziness available to everyone. The entire list as of the present is presented in Table 1 (following page).

Delaware County, Ohio, is a fast-growing community with a long tradition of political conservatism (in the traditional sense—concern about keeping the best of the past). A plurality of votes almost always goes to people thought of as conservative. And in addition to the traditional conservatives, it has what I call “crazy conservatives.” These people write letters excoriating President Obama, accusing him of being a dictator, that he is destroying the nation. They also write letters denying that humans cause climate change.

Fewer than half a dozen writers who have written multiple letters wrote the majority of the letters espousing these myths.

It might seem counterintuitive that denialist ideas are expressed by people living in a small community; however, the internet provides connections to numerous denialist websites.

Over the course of the past twenty years, I have been writing in journals about climate change. [1] I am also author of a book on energy that has two chapters on climate (see also [15-22]). In keeping current for the book [2], I have read a large number of papers in the professional journals such as *Nature*, *Science*, *Journal of Geophysical Research*, *Geophysical Research Letters*, *Climate Change*, *Nature Climate*

Change, etc. This background, and my interest in the philosophy of science has informed my responses to the letter-writers.

In the following sections, I present a selection of explanations of my responses to the Gazette’s opinionated epistolary scribes in no particular order.

## II. MYTH 1

Earth’s temperature isn’t rising, claim multiple writers. This is sometimes coupled with myths 8, 17, and 28 (Table I). Portions of Earth, particularly in Europe, have had instrumented temperatures recorded for about 250 years. (There is other information, often called temperature proxies, that allows temperatures to be well-estimated backward in time for a few thousand years. Examples are records of temperature and precipitation from tree-rings, ship logs, otoliths [fish ear bones], oxygen isotope ratios, as well as hundreds of other methods.)

There are several credible databases of global temperature anomalies available freely on the internet:

- The Hadley-Climate Research Unit temperature series 1, 2, 3, and 4 from 1850 to the present (of which HadCRUT4 is the most credible).
- The National Oceanic and Atmospheric Administration [3] dataset from 1880 to the present,
- The Goddard Institute of Space Science [4] dataset from 1880 to the present,
- And the Japan Meteorological Agency’s [5] dataset from 1895 to the present.

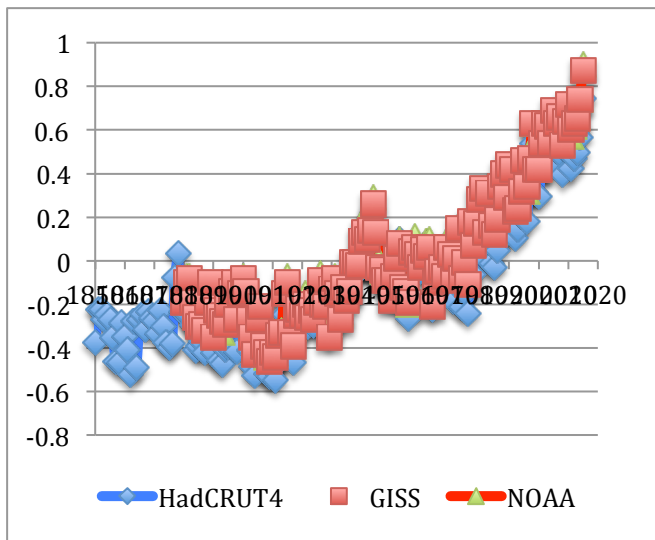
- [6] It is generally agreed that global instrumental land and water temperature coverage is both sweeping and reliable from 1880 onward.

TABLE I. Climate myths identified.

- Myth 1: Earth's temperature is not rising (*i.e.*, global warming is a myth).
- Myth 2: Human carbon emission has nothing to do with Earth's temperature.
- Myth 3: Humans are too puny to affect an entire planet.
- Myth 4: We do not have to reduce carbon emissions until we reach the 2 °C limit, or trillionth ton, because scientists can make the problem go away.
- Myth 5: *Irreversible* means *Unavoidable* †
- Myth 6: Emissions are due to everyone, so regulation of emissions can't solve the problem.
- Myth 7: Climate scientists disagree about whether humans have caused warming.
- Myth 8: While temperatures have fluctuated over the past 5,000 years, today's Earth temperature is below the average for these past 5,000 years.
- Myth 9: Earth's temperatures correlate with solar irradiance.
- Myth 10: As Earth was warming in the past century, so were Mars, Pluto, Jupiter and the largest moon of Neptune.
- Myth 11: 200 million years ago, when dinosaurs were alive, Earth's average atmospheric CO<sub>2</sub> concentration was 1,800 parts per million, > 4 times higher than today, so it is harmless.
- Myth 12: 900,000 years of ice core, temperature records and CO<sub>2</sub> content records, show that CO<sub>2</sub> increases follow rather than lead increases in Earth's temperature.
- Myth 13: The effect of additional CO<sub>2</sub> in the atmosphere is limited because it only absorbs certain wavelengths. As the radiation in that particular band is "used up," the amount left for absorption by more of the gas is reduced.
- Myth 14: We hear much about one or other melting glaciers, a recent study of 246 glaciers around the world indicated a balance between those that are losing ice, gaining ice, and remaining in equilibrium.
- Myth 15: The polar bear has become the symbol of global warming while its North American population has increased from 5,000 in 1960 to more than 25,000 today.
- Myths 16: The mathematical models on which the case for human-caused warming is based cannot predict past temperatures when all the data are known.
- Myth 17: Models did not predict the current 17 year constant temperature of our planet.
- Myth 18: Thermal energy is trapped solely in Earth's atmosphere.
- Myth 19: The Medieval and Roman warm periods were both several degrees warmer than today's temperatures.
- Myth 20: We cannot do anything, so we should give up.
- Myth 21: "The Greatest Hoax: How the Global Warming Conspiracy Threatens Your Future" °
- Myth 22: The alarmists' computer models simulated two to four times as much warming as what actually occurred in the past decade.
- Myth 23: We have had only minute increases in temperature in over a decade, given that the uncertainty is 0.1 °C.
- Myth 24: Pope should 'study up on world history'.
- Myth 25: Global warming is a manufactured deception to control people and the world economy.
- Myth 26: The global temperature records after 1880 are not reliable.
- Myth 27: The margin of error in global temperature is 0.1 degree C.
- Myth 28: Satellites do not show that Earth is warming.
- Myth 29: Scientists use minuscule numbers to claim global warming.
- Myth 30: The amount of Arctic ice increased considerably over the previous years.
- Myth 31: Climate scientists agree that Earth was going to be cooling during the 1960s and 1970s, possibly into an ice age.
- Myth 32: 31,000 (or 33,000) scientists and engineers do not think humans cause warming.
- Myth 33: 1000 scientists dispute anthropogenic global warming.
- Myth 34: This is all a creation of Al Gore. Anything Al Gore says can be dismissed out of hand.

† This is the title of an article in Science by Matthews and Solomon, [10] but the idea has been expressed many times in letters.

\* This is the title of Senator James Inhofe's book, and was not directly printed in the Delaware Gazette (though the sentiment was expressed indirectly); all other items were found in letters to the Gazette.



**FIGURE 1.** Temperature anomalies (HadCRUT4, NOAA, GISS).

In Figure 1 (second page following), I present the temperature anomalies from HadCRU, NOAA, and GISS (the JMS data are difficult to process. There is no question but that temperatures in the late 1800s were much lower than today's temperatures.

Miller *et al.* [7] look at Arctic temperatures and conclude that "5000 years of regional summertime cooling has been reversed, with average summer temperatures of the last ~100 years now higher than during any century in more than 44,000 years," and "[t] here has been no intervening century during which summer warmth exceeded that of the last ~100 years.

This is the first direct evidence that the contemporary warmth in the eastern Canadian Arctic now exceeds the peak warmth of the early Holocene."

Figure 4 in Ref. 8 (not shown) shows a reconstruction of European temperature anomalies from 500 BCE to 2000 AD compared to the 1901–2000 period. In this diagram, the 1800s are also cold compared to the present, but additional information is available: current temperature anomalies are higher than during the so-called Medieval Period (600-1200 AD) or the so-called Roman Warm Period (0-270 AD).

Marcott *et al.* [9] found in their Fig. 1 b and d (not shown) that temperature anomalies over the past eleven thousand years are lower than today's (anomalies are compared to the 1961-1990 period). These various strands of data seem to demonstrate conclusively that current temperature anomalies are unique at least for the past several thousand years.

Earth's temperature is rising, and it is rising quickly, more quickly than in any of the historical climate reconstructions considered here. Obviously, this misunderstanding is not limited to Gazette readers.

Some publications mislead readers: Forbes asserted that "2015 Was Not Even Close To Hottest Year On Record" (Forbes, Jan 2016), while the London Times ran a headline

*Some climate myths as published in a local newspaper that read "Planet is not overheating, says professor" (February 23, 2016).*

### III. MYTH 19

See the response to Myth 1 above for a discussion of the data.

### IV. MYTH 13

The effect of additional CO<sub>2</sub> in the atmosphere is limited because it only absorbs certain wavelengths. As the radiation in that particular band is "used up," the amount left for absorption by more of the gas is reduced. This myth claims that saturation occurs, a seemingly plausible claim (I have even heard this claim made during an Ohio State physics colloquium).

However, this claim flies in the face of research published 85 years ago—in 1931! [11] Saturation would imply radiative equilibrium.

E. O. Hulburt writes that:

"The temperature gradient in levels from 3 to 6 km is greater than that of convective equilibrium and hence the atmosphere would not be dynamically stable if radiation equilibrium prevailed. ...air currents take place to bring about convective equilibrium. Continuing the calculation it is found that only when the convective region extends to about 12 km (as is observed), with radiative equilibrium above 12 km (as is observed), does the atmosphere satisfy the conditions of dynamic stability and thermal equilibrium with the received solar energy. For this case, the calculated sea level temperature is 290 'K in good agreement with the observed value 287 'K."

He shows that "if the atmosphere were in radiative equilibrium at all heights the average temperature at sea level would be 306'K, or about 19' hotter, and at levels above 3 km more than 100' colder than it is. Such an atmosphere would be dynamically unstable and vertical convection currents would be set up."

### V. MYTH 28

Satellites do not show that Earth is warming This myth has been stated by many American politicians, such as Texas senator Ted Cruz and Texas representative Lamar Smith, both Republicans from a state that produces a great deal of oil.

Letter-writers assert that Prof. "John Christy, climate scientist and director of the Earth System Science Center at the University of Alabama in Huntsville, has said satellites do not show the earth is warming ... satellite data since 2001 is statistically insignificant. He is best known, jointly with climatologist Roy Spencer, for the first successful development of a satellite temperature record".

This myth is being supported by Profs. John Christy and Roy Spencer, of the University of Alabama in Huntsville (see the quote above). Their analyses of satellite data have

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been superseded. [12] The reanalysis does show that Earth is warming. Christy has said, “I’m sure the majority (but not all) of my IPCC colleagues cringe when I say this, but I see neither the developing catastrophe nor the smoking gun proving that human activity is to blame for most of the warming we see.”

The reality is that the satellites measure microwave radiation from certain molecular bands. To obtain a temperature, adjustments must be made; the inferred temperature is indirect. Noise needs to be dealt with. In other words, data need to be worked on to produce a satellite “temperature.” It is not like going outside with a thermometer!

Mears and Weentz reanalyzed the RSS satellite data and write “We have shown that the long-term changes in MSU/AMSU-derived atmospheric temperatures depend strongly on the details of the adjustments applied to account for changing measurement time. ... The resulting dataset shows more warming than the previous version of the dataset, particularly after 1998.” They go on: “In the tropics, the new dataset agrees well with the UW dataset, which was constructed using different methods but with a similar goal ...

Both, the UW and RSS datasets agree more closely with estimates of changes in total column water vapor than the STAR and UAH datasets”.

Despite knowing that data are indirect, and writing “my UAH cohort and boss John Christy, who does the detailed matching between satellites, is pretty convinced that the RSS data is undergoing spurious cooling”, Prof. Spencer had written:

“Until the discrepancy is resolved to everyone’s satisfaction, those of you who REALLY need the global temperature record to show as little warming as possible might want to consider jumping ship, and switch from the UAH to RSS dataset” [13].

Dr. Gavin Schmidt of NASA has analyzed graphs that Prof. Christy used during congressional testimony in February 2016 and found troubling problems [14] with:

- Choice of baseline,
- Inconsistent smoothing,
- Incomplete representation of the initial condition and structural uncertainty in the models,
- No depiction of the structural uncertainty in the satellite observations.

Schmidt writes:

“Christy’s graphs are designed to lead you to a single conclusion (that the models are too sensitive to forcings), by eliminating consideration of the internal variability and structural uncertainty in the observations”.

## VI. MYTH 10

As Earth was warming in the past century, so were Mars, Pluto, Jupiter and the largest moon of Neptune. This myth was conveyed by the “science director” of the Heartland Institute; an infamous denialist organization. It seems designed to trap people who are ignorant of science.

The implication of this statement seems to be that various planets and satellites are warming, so something, possibly the sun although this is left unsaid, is warming Earth. This makes no astronomical sense.

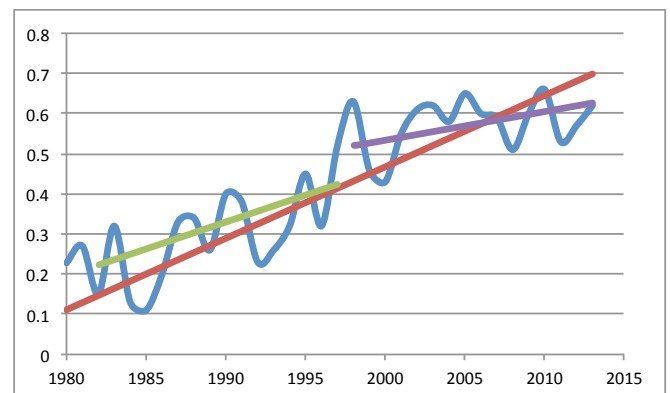
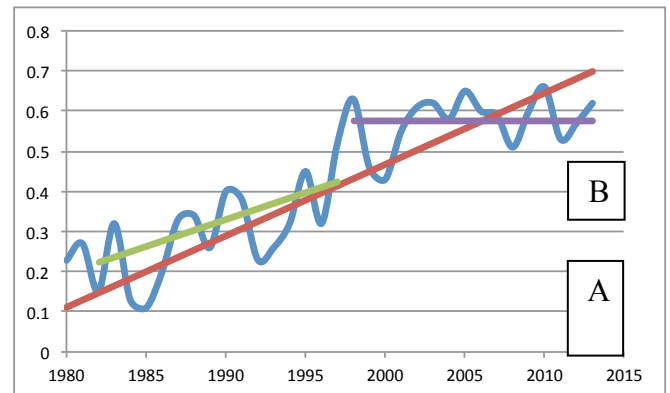
Most planets have orbits more elliptical than Earth’s. If they are nearing perihelion, they would certainly warm due to the closer distance to the sun, not to a change in the solar constant. There are any number of other possible reasons for selective warming of astronomical objects.

## VII. MYTH 17

Models did not predict the current 17 year constant temperature of our planet.

This is a myth because there is no 17-year record of constant temperature. The 15 years before that (green line), but the rise continues. The top ten warmest years are in order 2015, 2014, 2010, 2005, 1998, 2003, 2009, 2006, 2013, 2002 (HadCRUT4); 2015, 2014, 2010, 2005, 2007, 2013, 2009, (1998, 2002, 2006, 2012 tie) (GISS); and 2015, 2014, 2010, 2013, 2005, (1998, 2009 tie), 2012, (2003, 2006, 2007 tie) (NOAA).

You can see that 1998 (which had a “monster” El Niño) was chosen with malice aforethought to suggest the slope can be zero (Figure 2; this looks plausible). The eye is easily deceived, but the fit is not (Figure 3). It is smart to take care with such guiding of the eye.



**FIGURE 2.** A. Three slopes, the last to deceive the eye. B. Three slopes, best fits.

Recent publications have cast doubt on the “pause” in warming many denialists refer to 9as here). However, I do not have the space to treat them here.

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