

3 Oct 2016

Critique: The Signal and the Noise... Nate Silver - his chapter on climate
by Norman Rogers

Silver's chapter 12 discusses global warming / climate. He makes massive mistakes and unsupported assumptions. He does not understand the science. He claims that the science is straightforward. It isn't.

Chapter 12 in the Kindle edition: A Climate of Healthy Skepticism

The greenhouse effect had long been accepted theory, predicted by scientists to warm the planet. 2 But for the first time, Hansen said, it had begun to produce an unmistakable signal in the temperature record: global temperatures had increased by about 0.4 ° C since the 1950s, and this couldn't be accounted for by natural variations. "The probability of a chance warming of that magnitude is about 1 percent," Hansen told Congress. "So with 99 percent confidence we can state that the warming trend during this time period is a real warming trend." 3

Silver, Nate (2012-09-27). The Signal and the Noise: Why So Many Predictions Fail-but Some Don't (pp. 370-371). Penguin Group US. Kindle Edition.

Hanson's statement, made in 1988, should have been challenged. Although some warming did occur and there was a substantial increase in CO₂ in the atmosphere, that is correlation, not cause and effect. A similar warming took place starting in 1910 that cannot be blamed on CO₂ increase because there was very little CO₂ increase. The cause of that early century warming is still unknown. Hanson's claim of 99% confidence is simply scientific malpractice by a highly political scientist.

However, predictions are potentially much stronger when backed up by a sound understanding of the root causes behind a phenomenon. We do have a good understanding of the cause of global warming: it is the greenhouse effect.

Silver, Nate (2012-09-27). The Signal and the Noise: Why So Many Predictions Fail-but Some Don't (p. 373). Penguin Group US. Kindle Edition.

As I mentioned, we don't know what caused the 1910 global warming except that it was not the greenhouse effect. There are many things that can cause warming. For example a change in the sun's magnetic field that is related to the effect of

cosmic rays on forming condensation nuclei in the atmosphere. Or, for example, a change in the overturning circulation of the ocean that can add or remove vast quantities of heat from the atmosphere for decades. Sliver's statement simply represents ignorance of climate science.

The greenhouse effect is the process by which certain atmospheric gases—principally water vapor, carbon dioxide (CO₂), methane, and ozone—absorb solar energy that has been reflected from the earth's surface. Were it not for this process, about 30 percent⁹ of the sun's energy would be reflected back out into space in the form of infrared radiation. That would leave the earth's temperatures much colder than they actually are: about 0 ° Fahrenheit or -18 ° Celsius¹⁰ on average, or the same as a warm day on Mars. 11

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This is an incorrect explanation of the greenhouse effect. First of all about 30% of the sun's energy is already reflected back into space. The sun's radiation is primarily shorter wavelength light in the visual spectrum, not infrared. Further if it were infrared how would it get through the atmosphere to be reflected? No, shorter wavelength light from the sun penetrates the atmosphere and warms the earth. Because the earth is a warm body with a mean temperature of about 14 C it radiates infrared radiation. But, except for certain wavelengths, the infrared energy cannot penetrate the atmosphere very well. Only at high altitudes does the air become thin enough that infrared radiation emitted by the air easily escapes to space. The boundary between where infrared radiation cannot easily escape and where it can escape is not a sharp boundary but it roughly is at the boundary between the lower atmosphere, the troposphere, and the upper atmosphere, the stratosphere. The boundary is called the tropopause. The effect of adding greenhouse gases to the atmosphere is to raise the level of the tropopause because the greenhouse gases increase the resistance to escaping infrared radiation, so the tropopause ends up higher where the air is still thinner.

To understand why raising the tropopause would make the surface of the Earth hotter we have to look at how energy or heat is transferred from the surface to the tropopause where it can then escape as infrared radiation. At certain places on the Earth's surface the heat transmitted to the surface by sunlight creates rising air currents. As the air rises it expands and gradually cools. If the air contains water vapor the air may cool enough to form clouds at some altitudes. Condensation of water vapor releases considerable heat to the air. The rising hot

air moves heat upward toward the tropopause where upward convection stops and radiation of infrared takes over as a method of removing heat from the Earth. The rate at which the air cools as it rises is called the lapse rate. On average it is about 6 C per kilometer. If the air is dry the lapse rate is greater, about 10 C per kilometer. If the air is moist the lapse rate is less, say 5 C per kilometer. The condensing moisture releases heat as the air rises, inhibiting cooling.

The greenhouse effect is caused because if the tropopause is higher the air on the surface has to be hotter in order for the air to rise to the tropopause. Or, to say it another way, the surface has to be hotter to maintain the upward flow of heat or energy to the level that it can escape as infrared radiation.

If this explanation sounds complicated, be assured that it is an over simplification.

However, predictions are potentially much stronger when backed up by a sound understanding of the root causes behind a phenomenon. We do have a good understanding of the cause of global warming: it is the greenhouse effect.

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As I already mentioned there are many things besides the greenhouse effect that can cause global warming. The greenhouse effect is not well understood because, among other things, the relation of clouds on temperature is not well understood. Clouds at low levels cool the Earth because they reflect sunlight. The water vapor balance in the stratosphere, that affects the greenhouse effect is not well understood. Then there are predicted effects of the greenhouse effect that have not been observed unambiguously. According to theory the upper atmosphere in the tropics should warm faster than the surface due to the greenhouse effect. It is a subject of dispute if this is taking place.

The amount of warming of the Earth in the 20th century, prior to 1979 when temperature measuring satellites came into use, is highly disputed and frequently revised. There is pervasive evidence that the warming is exaggerated due to the urban heat island effect as cities grow and envelop temperature measuring stations formerly in the country. Although attempts are made to compensate for this effect it is probable that the compensation is insufficient.

The third claim— that water vapor will also increase along with gases like CO₂, thereby enhancing the greenhouse effect— is modestly bolder. Water vapor, not CO₂, is the largest contributor to the greenhouse effect. 21 If there were an increase in CO₂ alone, there would still be some warming, but not as much as has been observed to date or as much as scientists predict going forward. But a basic thermodynamic principle known as the Clausius– Clapeyron relation, which was proposed and proved in the nineteenth century, holds that the atmosphere can retain more water vapor at warmer temperatures. Thus, as CO₂ and other long-lived greenhouse gases increase in concentration and warm the atmosphere, the amount of water vapor will increase as well, multiplying the effects of CO₂ and enhancing warming.

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The claim that greenhouse warming will be multiplied by increased water vapor (usually the factor of about 3 times is used) depends on the water vapor above the tropopause, not the water vapor near the surface. The movement of water vapor into the stratosphere is poorly understood and poorly measured. Rising air that reaches the tropopause is very dry because the water vapor has condensed out due to cooling of the air.

Scientists require a high burden of proof before they are willing to conclude that a hypothesis is incontrovertible. The greenhouse hypothesis has met this standard, which is why the original IPCC report singled it out from among hundreds of findings as the only thing that scientists were absolutely certain about. The science behind the greenhouse effect was simple enough to have been widely understood by the mid- to late nineteenth century, when the lightbulb and the telephone and the automobile were being invented—

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By this time it should be clear that the above statement is just silly. The science is not simple. What is important is how strong is the greenhouse effect, not whether it exists or not. Further, the IPCC is a highly politicized organization not to be trusted.

This IPCC finding makes several different assertions, each of which is worth considering in turn. First, it claims that atmospheric concentrations of greenhouse

gases like CO2 are increasing, and as a result of human activity. This is a matter of simple observation. Many industrial processes, particularly the use of fossil fuels, produce CO2 as a by-product. 18 Because CO2 remains in the atmosphere for a long time, its concentrations have been rising: from about 315 parts per million (ppm) when CO2 levels were first directly monitored at the Mauna Loa Observatory in Hawaii in 1959 to about 390 PPM as of 2011.19

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Yes, CO2 concentrations are increasing, but the amount of CO2 in the atmosphere is also affected by the temperature and the behavior of the oceans where 50 times as much CO2 is stored as in the atmosphere. About twice as much CO2 is released by burning fossil fuels as actually appears in the atmosphere. The rest is presumed to be absorbed into the ocean or incorporated into plants.

The IPCC is potentially a very good example of a consensus process. Their reports take years to produce and every finding is subject to a thorough— if somewhat byzantine and bureaucratic— review process. “By convention, every review remark has to be addressed,” Rood told me. “If your drunk cousin wants to make a remark, it will be addressed.”

Silver, Nate (2012-09-27). The Signal and the Noise: Why So Many Predictions Fail-but Some Don't (p. 383). Penguin Group US. Kindle Edition.

This remark is hilarious to anyone who has read the serious critiques of the IPCC. (The Delinquent Teenager Who Was Mistaken for the World's Top Climate Expert Oct 28, 2011 by Donna Laframboise)

Conclusion

There is more to Chapter 12, but I hope that I've shown enough to make any reader highly skeptical concerning Silver's support for the global warming establishment. More is available at climateviews.com.

