



Summary

- Weather and climate data show climate change has a minimal impact on Idaho.
- Idaho temperatures have warmed only modestly during recent decades.
- Idaho is experiencing a long-term gradual increase in precipitation, alleviating any fears of a long-term increase in drought.
- What little warming has occurred has largely been beneficial for Idaho, with crop production setting new records virtually every year.
- Idaho already emits few carbon dioxide emissions, with almost no impact on global temperature.

Climate Change and Idaho: A Scientific Assessment

By James Taylor

Executive Summary

During an Idaho House Environment, Energy, and Technology Committee hearing in March 2019, legislators proposed creating an interim legislative committee “to study the effects of climate variability on Idaho’s state agencies that are responsible for resource management” and to make appropriate recommendations to address climate issues.¹ That proposal, though unsuccessful, was spurred by comments made by Idaho Gov. Brad Little two months earlier suggesting that climate change “is real” and “a big deal.”²

This paper provides Idaho-specific climate information to help inform lawmakers so that they can craft the best possible climate-related policies on behalf of the people of Idaho. The paper will provide information on the following topics:

¹ Nathan Brown, “Bill to study climate change barely makes it past first hurdle,” *Idaho State Journal*, March 7, 2019, https://www.idahostatejournal.com/news/local/bill-to-study-climate-change-barely-makes-it-past-first/article_e2037a8b-03a8-563b-b972-286d6704b22f.html

² Betsy Russell, “Little on Climate Change: It’s a ‘Big Deal,’” *Idaho Press*, January 16, 2019, https://www.idahopress.com/eyeonboise/little-on-climate-change-it-s-a-big-deal/article_3238edd4-e49a-5bf2-a917-36e4556eb00c.html

1. A Summary of Global Climate Change

During the past three million years, climate has alternated between ice age glacial periods and warmer interglacial periods.³ The modest warming of the past century has lifted temperatures from the depths of the coldest period of the past 10,000 years, known as the Little Ice Age. Temperatures remain relatively low compared to the temperatures experienced prior to the Little Ice Age. Higher temperatures have been mostly beneficial to human wellbeing. They have spurred higher crop yields and reduced the prevalence of cold temperatures, which kill 20 times more people than moderate or high temperatures.⁴

2. Climate Change in the United States

Warming in the United States has been modest, especially since the turn of the twenty-first century. Government officials have “adjusted” older temperature data, which has made the past appear colder than it actually was and has made the rise in global temperature that has occurred over the past century look more dramat-

ic.⁵ More reliable data from weather stations not situated in urban heat sinks show relatively low amounts of warming. The National Oceanic and Atmospheric Administration’s (NOAA) newest, most reliable temperature stations, brought online nationally in 2005, show virtually no warming since their inception. Objective data also show extreme weather events are generally not becoming more frequent or severe.

3. Climate Change in Idaho

Weather and climate data show climate change has had a minimal impact on Idaho. Idaho temperatures have warmed only modestly during recent decades.⁶ Complementing this modest warming, Idaho is experiencing a long-term gradual increase in precipitation, alleviating any fears of a long-term increase in drought. Further, what little warming has occurred has largely been beneficial for Idaho, as it has throughout much of the world. Idaho crop production sets new records almost every year, due in significant part to longer growing seasons, fewer frost events, and more atmospheric carbon dioxide (CO₂).

³ Sandy Eldredge and Bob Biek, “Ice Ages – What Are They and What Causes Them?,” Utah Geological Survey, accessed August 28, 2019, <https://geology.utah.gov/map-pub/survey-notes/glad-you-asked/ice-ages-what-are-they-and-what-causes-them>

⁴ Antonio Gasparrini *et al.*, “Mortality risk attributable to high and low ambient temperature: a multicountry observational study,” *The Lancet*, Vol. 386, July 25, 2015, <https://www.thelancet.com/action/showPdf?pii=S0140-6736%2814%2962114-0>

⁵ Tony Heller, “61% of NOAA USHCN Adjusted Temperature Data Is Now Fake,” RealClimateScience.com, February 11, 2019, <https://realclimatescience.com/2019/02/61-of-noaa-ushcn-adjusted-temperature-data-is-now-fake>

⁶ National Centers for Environmental Information, “Climate at a Glance,” Statewide Time Series, Idaho, Average Temperatures 1895–2019, National Oceanic and Atmospheric Administration, accessed August 2019, https://www.ncdc.noaa.gov/cag/statewide/time-series/10/tavg/all/12/1895-2019?base_prd=true&firstbaseyear=1901&lastbaseyear=2000&trend=true&trend_base=10&firsttrendyear=1895&lasttrendyear=2019

4. Idaho Energy Use and Impacts

Even if CO₂ were associated with catastrophic global warming, Idaho has already dramatically curtailed its CO₂ emissions. Idaho ranks in the top 10 states for lowest total emissions and lowest emissions per person.⁷ The majority of Idaho electricity is generated by emissions-free hydroelectric power, with nonhydroelectric renewables providing the second highest share of electricity. There are no utility-grid coal power plants in Idaho. As a result, if Idaho were to eliminate all CO₂ emissions, the resulting impact on global temperature would be much too small to measure.

1. A Summary of Global Climate Change

To understand climate change in Idaho, it is important to understand the context of global climate change. This section provides a brief overview.

Naturally occurring changes are a constant feature of Earth's dynamic climate. Modest recent changes in global climate fit well within natural variability. Approximately three mil-

lion years ago, Earth entered an ice age epoch that is still in effect.⁸ Glaciations have dominated this long period, with recurring ice-sheet advances lasting for 100,000 years to 150,000 years and short warming periods, known as interglacial warm periods, occurring for an average of approximately 10,000 years.⁹ Earth is currently in the midst of an interglacial warm period, one that has lasted for the past 10,000 years.

Within glaciations and interglacial warm periods, dramatic changes in temperature and climate are the rule rather than the exception. Temperature changes of several degrees Celsius regularly occur, often quite suddenly. Even before the warming of the past century, our current interglacial warm period has produced temperatures oscillating within a range of several degrees Celsius.¹⁰ Current temperatures, even after approximately 150 years of gradual recovery from the cold of the Little Ice Age, remain within the lower end of interglacial warm-period temperatures.¹¹

History reveals higher temperatures have always been more beneficial to human health and welfare than lower temperatures. A Medieval Warm Period that began in approximately AD 1,000 brought temperatures as warm or warm-

⁷ U.S. Energy Information Administration, "State Profile and Energy Estimates: Idaho," *Independent Statistics & Analysis*, accessed August 2019, <https://www.eia.gov/state/?sid=ID#tabs-4>

⁸ Sandy Eldredge and Bob Biek, *supra* note 3.

⁹ Michael Marshall, "The history of ice on Earth," *New Scientist*, May 24, 2010, <https://www.newscientist.com/article/dn18949-the-history-of-ice-on-earth>

¹⁰ Craig Idso, David Legates, and S.F. Singer, "Climate Science," in *Climate Change Reconsidered II: Fossil Fuels*, Nongovernmental International Panel on Climate Change, (Arlington Heights, IL: The Heartland Institute, 2019), p. 137, <http://climatechangereconsidered.org/wp-content/uploads/2019/01/Full-Book.pdf>

¹¹ U.N. Intergovernmental Panel on Climate Change, *First Assessment Report*, 1990, p. 202, https://www.ipcc.ch/site/assets/uploads/2018/03/ipcc_far_wg_i_full_report.pdf.

er than our current climate. It was the catalyst for increasing crop production, human population, and prosperity.¹² During that time, wine grapes were grown in normally chilly England and Vikings were able to settle and establish farms in normally inhospitable Greenland. The onset of the Little Ice Age around AD 1,300, however, contributed significantly to an era of crop failures, plague, pestilence, and declining human population.¹³

During the past 150 years, Earth slowly emerged from the Little Ice Age. This warming, which began before the invention of coal-fired power plants and automobiles, has brought immeasurable benefits. Crop production sets new records almost every year. Satellite instruments have measured a dramatic greening of earth.¹⁴ Deserts are receding and plant life is

increasingly taking root in arid regions of the globe.¹⁵ Extreme weather events are becoming less frequent.¹⁶ Lower temperatures, which kill far more people than moderate or high temperatures, are becoming less frequent.¹⁷

The pace of recent warming continues to be much slower than U.N. climate model predictions. In 1990, the U.N. Intergovernmental Panel on Climate Change (IPCC) predicted global temperature would rise by 0.3 degrees C per decade.¹⁸ However, empirical temperature data covering the three decades following 1990 show the average global temperature rise has been only about 0.13 degrees C per decade, less than half the pace IPCC predicted.¹⁹ As a result, IPCC lowered its prediction to just two-tenths of a degree C per decade, and likely will need to lower it again.²⁰ It is probable that

¹² John P. Rafferty, "Medieval warm period," *Encyclopedia Britannica*, accessed August 2019, <https://www.britannica.com/science/medieval-warm-period>

¹³ Mauricio Lima, "Climate change and the population collapse during the 'Great Famine' in pre-industrial Europe," *Ecology and Evolution*, Vol. 4, Issue 3, January 2, 2014, <https://onlinelibrary.wiley.com/doi/full/10.1002/ece3.936>

¹⁴ NASA, "Carbon Dioxide Fertilization Greening Earth, Study Finds," April 26, 2016, <https://www.nasa.gov/feature/goddard/2016/carbon-dioxide-fertilization-greening-earth>

¹⁵ Randall J. Donohue *et al.*, "Impact of CO₂ fertilization on maximum foliage cover across the globe's warm, arid environments," *Geophysical Research Letters*, May 15, 2013, <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/grl.50563>

¹⁶ Michael Bastach, "UN's New Report Shows There's 'Little Basis' for a Favorite Claim of Climate Activists," *Daily Caller*, October 8, 2018, <https://www.thegwpf.com/ipcc-report-extreme-weather-events-not-getting-worse>; James Taylor, "Sorry Global Warming Alarmists, But Extreme Weather Events Are Becoming Less Extreme," *Forbes.com*, May 8, 2013, <https://www.forbes.com/sites/jamestaylor/2013/05/08/sorry-global-warmists-but-extreme-weather-events-are-becoming-less-extreme/#7fd1651a55a4>.

¹⁷ Antonio Gasparrini *et al.*, *supra* note 4.

¹⁸ U.N. Intergovernmental Panel on Climate Change, *supra* note 11, p. xxii.

¹⁹ Roy Spencer, "Global Warming," *drroyspencer.com*, January 2, 2019, <http://www.drroyspencer.com/2019/01/uah-global-temperature-update-for-december-2018-0-25-deg-c>

²⁰ U.N. Intergovernmental Panel on Climate Change, *Fifth Assessment Report*, 2014, p. 4, https://www.ipcc.ch/site/assets/uploads/2018/05/SYR_AR5_FINAL_full_wcover.pdf

Figure 1: Raw U.S. Temperature Readings vs. Adjusted Data

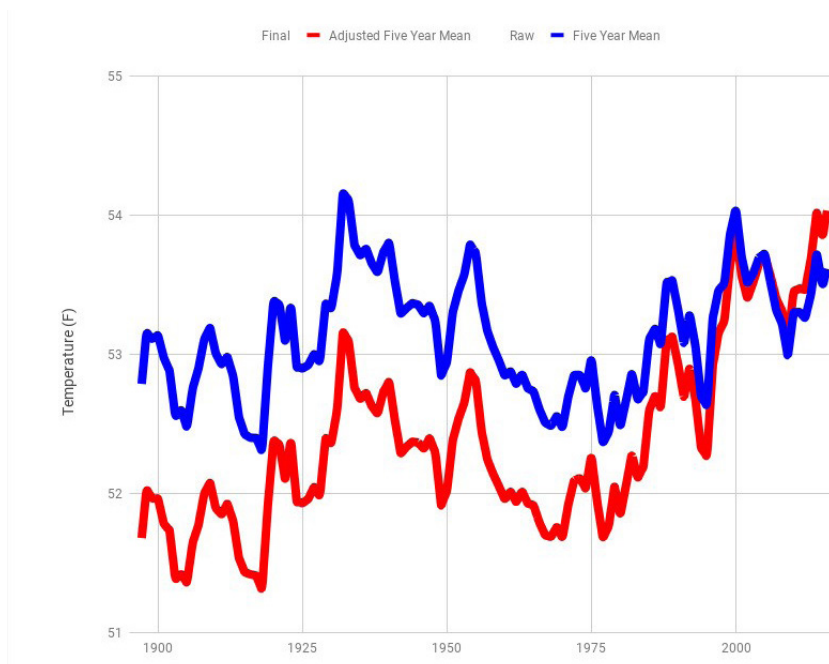


Figure 1: The blue line represents the actual thermometer readings, which show only modest recent warming. The unadjusted temperature readings show temperatures are no higher now than they were 80 years ago. *Source:* Tony Heller, “61% Of NOAA USHCN Adjusted Temperature Data Is Now Fake,” *realclimatescience.com*, February 11, 2019, <https://realclimatescience.com/2019/02/61-of-noaa-ushcn-adjusted-temperature-data-is-now-fake>. Data from NOAA U.S. Historical Climatology Network, Carbon Dioxide Information Analysis Center, accessed September 4, 2019, <https://cdiac.ess-dive.lbl.gov/epubs/ndp/ushcn/ushcn.html>.

as this modest warming continues, so will the tangible, measurable net benefits.²¹

2. Climate Change in the United States

Long-term warming in the United States has been modest, at most. Thermometers at weather stations throughout the country show significant warming from the late 1800s through

the mid-1940s, cooling from the mid-1940s through the late 1970s, and then modest warming since the late 1970s. Thermometer readings in the United States report current temperatures are approximately the same as they were 80 years ago.²²

The reality that thermometer readings have shown no dramatic climate change is masked in part by government gatekeepers who have adjusted raw data to give the appearance of more recent warming.²³ (See Figure 1.) Specifically,

²¹ For a fuller discussion of why temperatures are not rising as fast as United Nations predictions, see Craig Idso, Robert Carter, and Fred Singer, *Why Scientists Disagree About Global Warming*, (Arlington Heights, IL: The Heartland Institute, 2016).

²² Tony Heller, *supra* note 5.

²³ *Ibid.*

temperatures from past decades have been adjusted downwards. This gives the appearance of approximately 1.5 degrees Fahrenheit (0.8 degrees C) of warming compared to the early twentieth century. As a result, virtually all reported warming in the United States during the past 80 years is a result of controversial adjustments to the raw temperature data. As previously noted, the unadjusted, raw data show current temperatures are approximately the same as they were in the 1930s.

The asserted reasons for the temperature adjustments are that land-use changes, inconsistencies in what time of day temperature readings are made, and other variables affected reported temperatures. However, to the extent this may be true, the identified inconsistencies should lead researchers to the conclusion that recent temperatures should be adjusted so that they are lower, not higher. Most notably, land-use changes have tended to result in long-term weather stations being located in urban areas, where asphalt and industrial activity has caused temperatures to appear higher than they otherwise would be.²⁴

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Additionally, the recent practice of using latex paint on boxes containing thermometers also artificially increases temperature readings.²⁵

Thus, if adjustments to the raw data from urban heat islands ought to be made, they should be adjusted downward. If they were altered in this

way, temperature data would show, at most, only a small amount of warming over the past 80 years. However, despite these well-established concerns, government overseers of temperature data continue to adjust temperature data from past decades upward, giving the appear-

ance that the record shows significantly more warming.

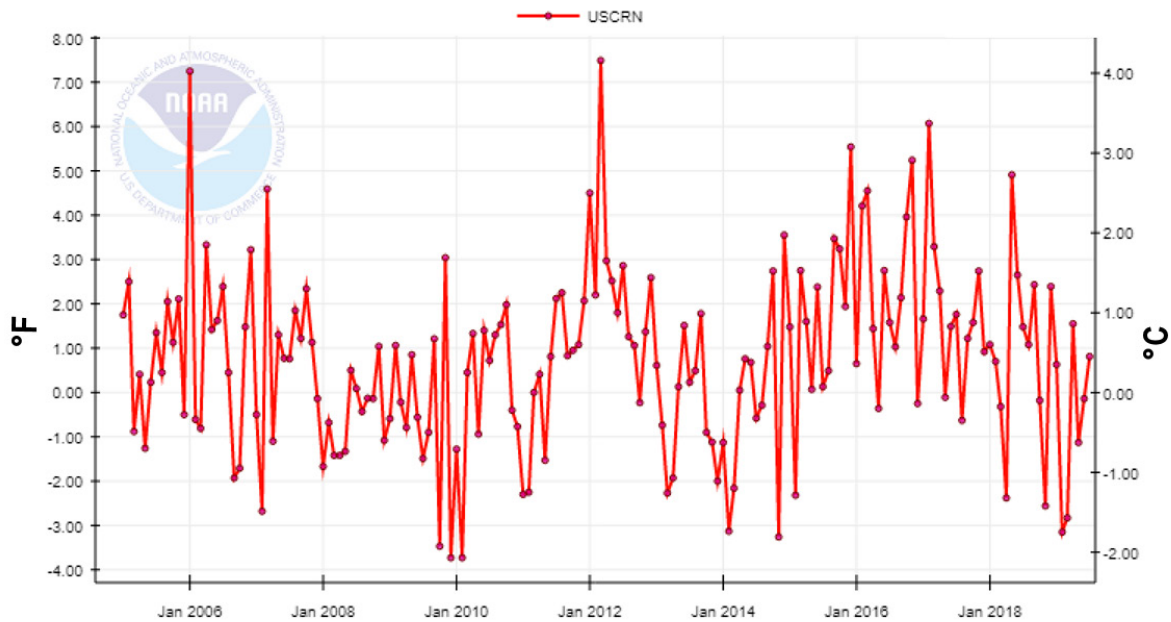
With that said, even the controversially adjusted data show U.S. warming has occurred at a pace of merely 0.18 degrees F per 10 years, or one-tenth of one degree C per 10 years, during recent decades. This is only one-third of the 0.3 degrees C warming that was predicted by the IPCC in 1990.

To its credit, NOAA in 2005 implemented a

²⁴ See Anthony Watts, “Satellites Image the Urban Heat Islands in the Northeast,” wattsupwiththat.com, December 14, 2010, <https://wattsupwiththat.com/2010/12/14/image-the-urban-heat-islands-in-the-northeast>, citing data from NASA, “Satellites Pinpoint Drivers of Urban Heat Islands in the Northeast,” December 13, 2010, [nasa.gov](http://www.nasa.gov), <https://www.nasa.gov/topics/earth/features/heat-island-sprawl.html>; CO2 Science, “The Impacts of Urban Heat Islands on Natural Warming Trends,” [CO2science.org](http://www.co2science.org), May 5, 2017, <http://www.co2science.org/articles/V20/may/a4.php>; and A.T.J. de Laat and A.N. Maurellis, “Industrial CO2 emissions as a proxy for anthropogenic influence on lower tropospheric temperature trends,” *Geophysical Research Letters*, Vol. 31, Issue 5, March 11, 2004, <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2003GL019024>

²⁵ Anthony Watts, *Is the U.S. Temperature Record Reliable?*, (Arlington Heights, IL: The Heartland Institute, 2009), January 2009, https://www.heartland.org/_template-assets/documents/publications/SurfaceStations.pdf

Figure 2: Contiguous Average U.S. Temperature Anomaly, Based on Average Temperature from 1980–2010



Source: Data provided by U.S. Climate Reference Network, National Oceanic and Atmospheric Administration, accessed August 2019, https://www.ncdc.noaa.gov/temp-and-precip/national-temperature-index/time-series?data-sets%5B%5D=uscrn¶meter=anom-tavg&time_scale=p12&begyear=2005&endyear=2019&month=7 Chart provided by meteorologist Anthony Watts.

network of more than 100 pristine weather stations throughout the lower 48 states, commonly called the U.S. Climate Reference Network (CRN). CRN's temperature readings are not subject to any adjustments, because CRN collects temperature data uniformly, utilizes consistent observation practices, and the stations are situated far from urban areas, where human activities inaccurately impact temperature data. CRN's temperature data, going back to 2005, show no warming in the continental United States during this period. (See Figure 2.)

Curiously, even after implementing its nationwide network of uncorrupted weather and temperature stations, NOAA has continued

to publish official temperature data—including its Idaho-specific data—sourced from its faulty and admittedly corrupted network, rather than from the much more accurate CRN network. Utilizing the old, faulty network provides government overseers an excuse to alter data and produce reported warming that does not appear in any of the raw temperature readings, including readings produced by the CRN network.

Regardless of how much warming is occurring, the feared negative consequences of higher temperatures have not occurred. To the contrary, scientific evidence shows crop production throughout the world sets new records virtually every year, including in the United

States.²⁶ Satellite instruments show a greening of earth, including in the United States.²⁷ Health studies and mortality data show lower temperatures and cold winter months kill far more people globally and in the United States than high temperatures and hot summer months.²⁸ And although extreme weather events continue to occur, there is no indication extreme weather events are becoming more frequent or severe in the United States in recent decades.²⁹

In short, a warmer world and a warmer United States are proving to be more beneficial for human health and welfare than a colder world and colder United States.

3. Climate Change in Idaho

In recent decades, Idaho has experienced few long-term temperature and precipitation changes. And to the extent some changes have occurred, the available reliable evidence indicates those changes have been largely beneficial.

Temperature Changes

The adjusted data from the NOAA, which dates back to the late 1800s, show temperatures in Idaho are rising at a pace of approximately one-tenth of a degree F (0.06 degrees C) per decade. This translates to 1 degree F (0.6 degrees C) per century.³⁰ This is well within natural historical variation and merely one-third of the 3 degrees C of warming that was predicted by the United Nations' flawed computer models.

Also importantly, there has been no increase in the modest pace of warming in recent years in Idaho. For example, Idaho temperatures during the past 15 years show an average temperature increase of one-tenth of a degree F per decade, the same rate of increase as the longer-term data.³¹

Further, the two Idaho stations in the CRN network confirm there has been minimal, if any, recent warming in Idaho. Data from one of the two Idaho stations show a slight warming trend, while the other station's data reveal a slight cooling trend. (See Figures 3 and 4.)

²⁶ U.N. Food and Agriculture Organization, "World Food Situation," last updated April 7, 2019, <http://www.fao.org/worldfoodsituation/csdb/en>; U.S. Department of Agriculture, "Crop Production Historical Track Records," April 2018, https://www.nass.usda.gov/Publications/Todays_Reports/reports/croptr18.pdf.

²⁷ NASA, *supra* note 14.

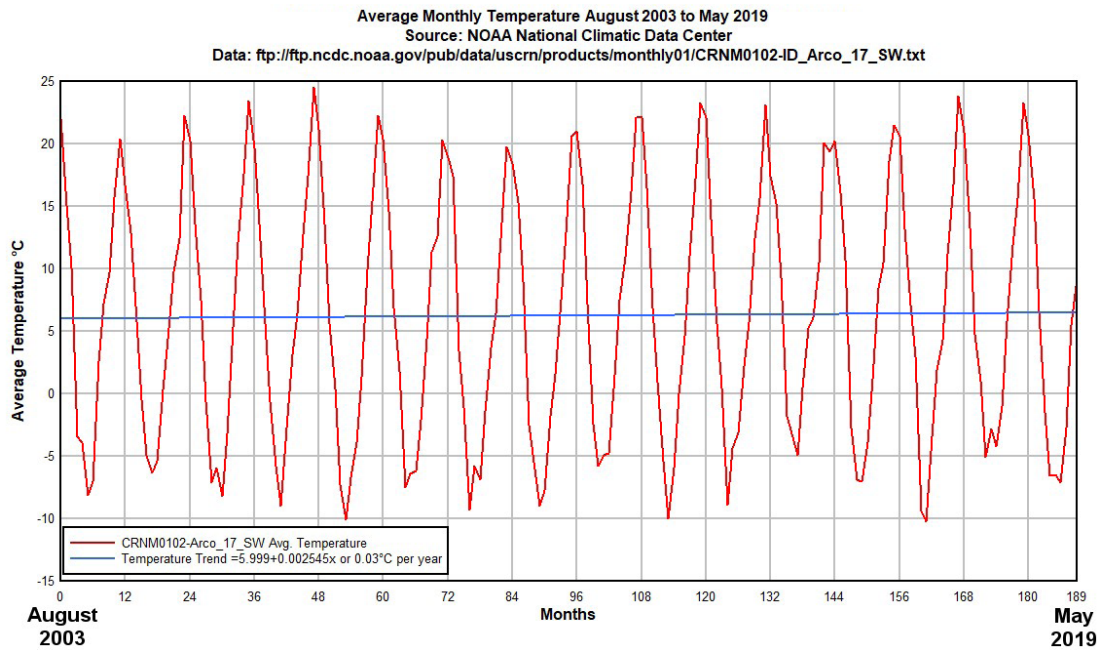
²⁸ Antonio Gasparrini *et al.*, *supra* note 4; Indur M. Goklany, "Winter Kills: Excess Deaths in the Winter Months," wattsupwiththat.com, January 6, 2010, <https://wattsupwiththat.com/2010/01/06/winter-kills-excess-deaths-in-the-winter-months>

²⁹ Michael Bastach, *supra* note 16; James Taylor, *supra* note 16.

³⁰ National Centers for Environmental Information, *supra* note 6.

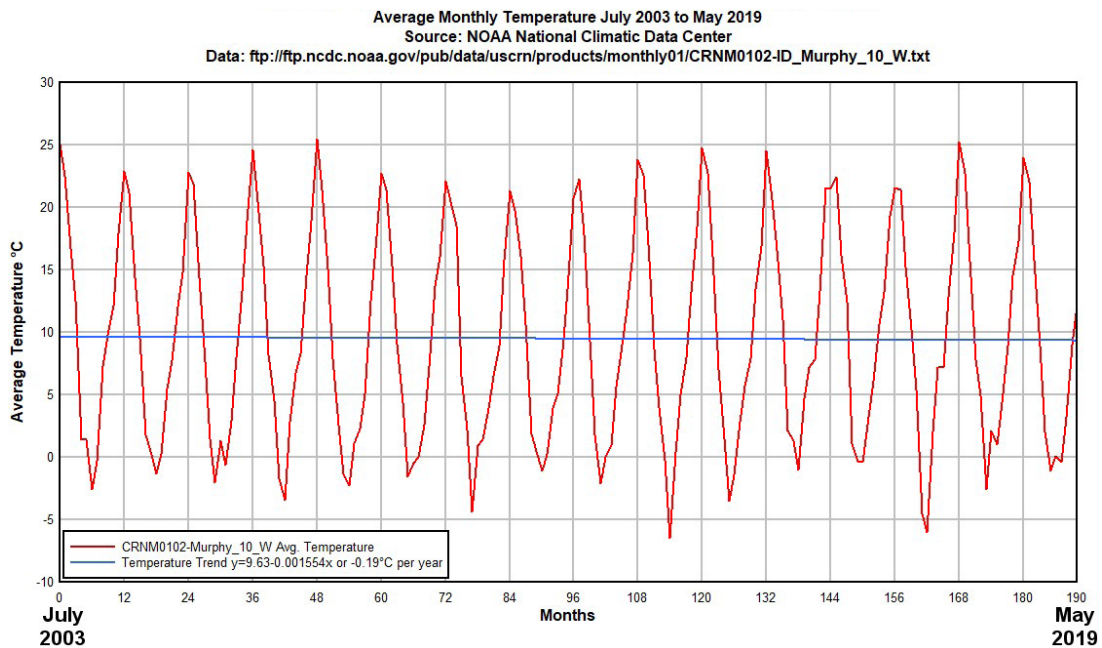
³¹ *Ibid.*

Figure 3: U.S. Climate Reference Network Temperature Readings at Arco, Idaho



Source: Data provided by the U.S. Climate Reference Network and National Oceanic and Atmospheric Administration's National Climatic Data Center, accessed August 2019, <https://www.ncdc.noaa.gov/crn>. Graphed by meteorologist Anthony Watts.

Figure 4: U.S. Climate Reference Network Temperature Readings at Murphy, Idaho



Source: Data provided by the U.S. Climate Reference Network and National Oceanic and Atmospheric Administration's National Climatic Data Center, accessed August 2019, <https://www.ncdc.noaa.gov/crn>. Graphed by meteorologist Anthony Watts.

Additionally, NOAA data for Idaho show there is no long-term trend regarding the frequency of extreme summer heat. From 2000 to 2009, there was a modest increase in the number of days with recorded temperatures above 95 degrees F, but the number of days with temperatures above 95 degrees F were fewer than the average recorded in the two five-year periods before and after the 2000–09 period (1995–99 and 2010–14).³² In fact, the NOAA data show there were far more days with recorded temperatures above 95 degrees during the 1920s and 1930s than during any 20-year period since. For example, NOAA reports there were only 35 days with temperatures above 95 degrees during the 1995–2014 period (the latest 20-year period for which NOAA has published data), compared to 43 days with temperatures above 95 degrees from 1920 to 1939.³³

The warming that is now occurring is positively impacting the coldest of winter cold spells. From 1910 to 1950, Idaho averaged approximately 10 nights per year with temperatures below 0 degrees F. By contrast, Idaho has experienced an average of approximately 5.5 such brutally cold nights per year since 1990.³⁴

Higher overall temperatures are leading to fewer wild swings in temperature, too. The 1920s and 1930s, for example, had the most frequent extreme summer high temperatures and a higher-than-average frequency of ex-

treme winter cold. The very modest global warming experienced over the past few decades appears to have softened these extreme temperature swings.³⁵

Precipitation Changes

NOAA data also reveal there has been a modest increase in Idaho precipitation since the late 1800s, which should alleviate concerns that global warming is causing droughts in the state.³⁶ Although drought has occurred in Idaho during the past few years (a condition that has happened intermittently throughout the historical record), the modest long-term increase in participation occurring since the late 1800s has persisted thus far in the twenty-first century. Moreover, the summer drought months of July, August, and September each show either no change in average precipitation or a modest increase in average precipitation compared to a century ago.³⁷

More abundant precipitation has accompanied the modest warming that has occurred in Idaho. Since the early 1900s, average precipitation in Idaho has increased from approximately 1.9 inches per month to just over 2 inches per month.³⁸ Idaho precipitation is also becoming less extreme. There has been a declining trend in the average amount of precipitation in

³² *Ibid.*

³³ *Ibid.*

³⁴ *Ibid.*

³⁵ *Ibid.*

³⁶ *Ibid.*

³⁷ *Ibid.*

³⁸ *Ibid.*

Figure 5: Annual Precipitation Highs, Lows, and Averages in Idaho

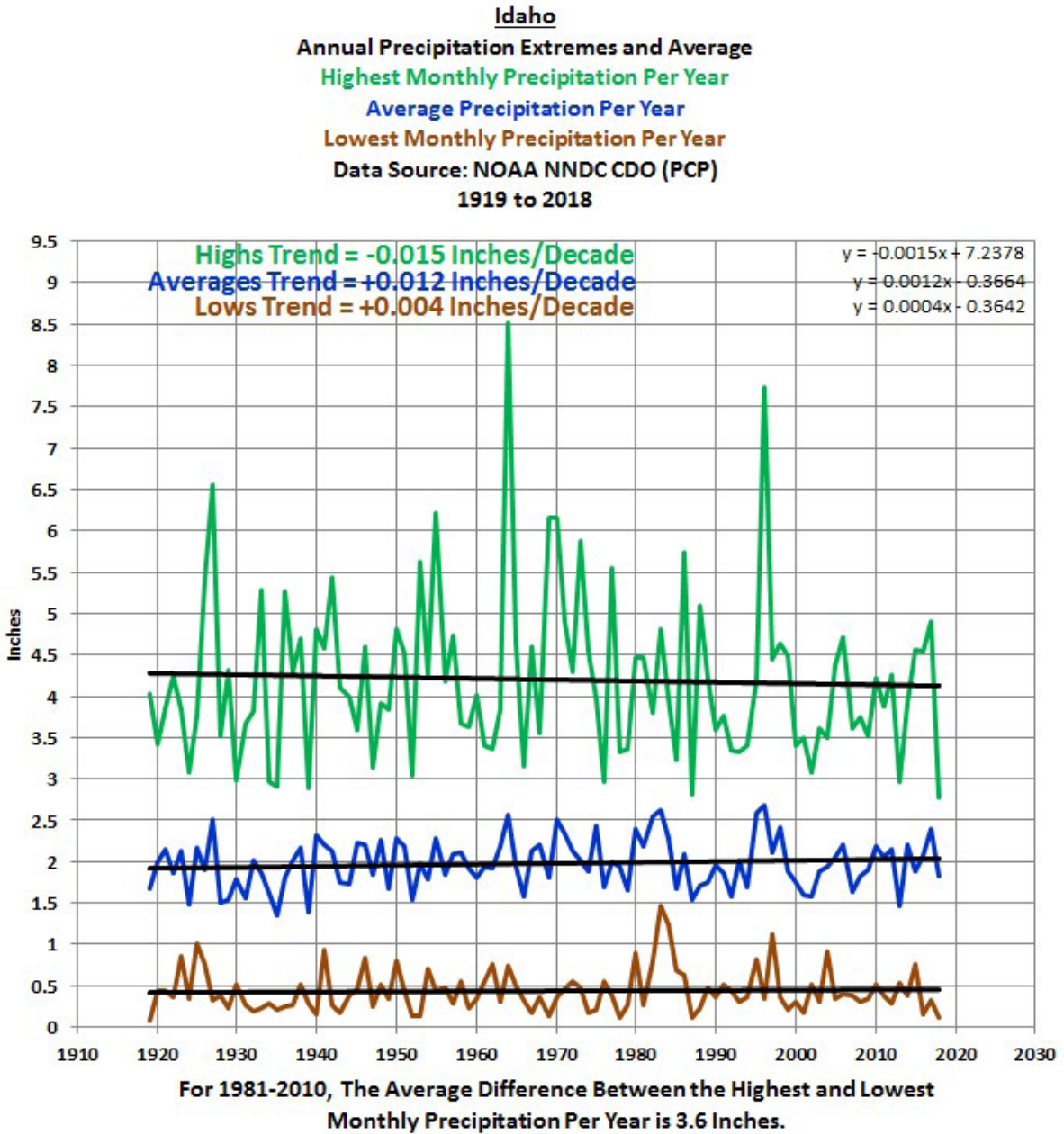


Figure 5: The brown line shows a slight increase in Idaho precipitation during the driest month of the year. The green line shows a decline in precipitation during the wettest month of the year. Source: Data provided by NOAA Cooperative Observer Network, National Oceanic and Atmospheric Administration, accessed August 2019, <https://www.ncdc.noaa.gov/cdo-web/datatools/records>. Data graphed by Robert Tisdale and meteorologist Anthony Watts.

Figure 6: Annual Palmer Drought Severity Index Extremes and Averages in Idaho

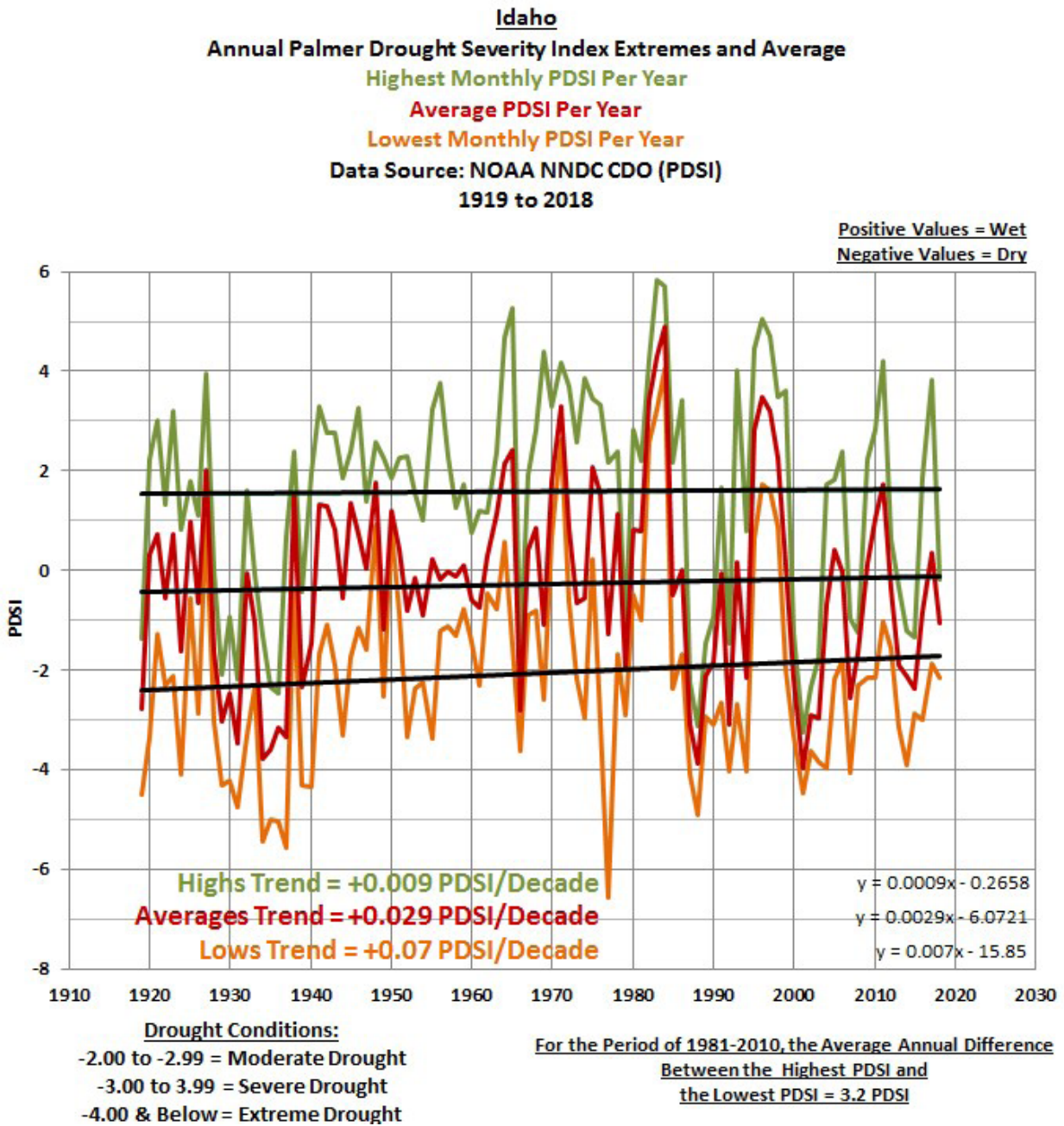


Figure 6: The green line shows no trend in the number of Idaho high-precipitation and soil-saturation events. The orange line shows low-precipitation and drought events are becoming less frequent and severe. Source: National Climatic Data Center, “Annual Palmer Drought Severity Index Extremes and Averages,” National Oceanic and Atmospheric Administration, accessed August 2019, <https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers>. Data graphed by by Robert Tisdale meteorologist Anthony Watts.

the wettest month of the year, while there has been an increase in the average amount of precipitation during the driest month of the year.³⁹ (See Figure 5.)

The Palmer Drought Severity Index averages for Idaho confirm there has been no long-term trend showing an increase in the number of severe high-precipitation and soil-saturation events. However, there has been a significant reduction in the frequency and severity of low-precipitation and drought events. (See Figure 6.) Idaho has received modestly more precipitation as the Earth's climate has modestly warmed during the past century, reducing the frequency and severity of drought events.⁴⁰

Beneficial Climate Trends

To the extent some warming in Idaho has occurred, the evidence indicates higher tempera-

tures, as well as the additional atmospheric CO₂, have likely provided more benefits than harms.

For example, agricultural growing seasons are longer compared to several decades ago and Idaho crop yields set new records nearly every year. Potatoes are Idaho's most important and lucrative crop.⁴¹ The U.S. Department of Agriculture estimates the 2018 Idaho potato crop set new records for total production and yield per acre.⁴² The 2018 projected record follows a record set in 2017 for

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total Idaho potato production value, despite the fact Idaho farmers planted 5 percent fewer acres with potatoes in 2017 than they did in 2016.⁴³

Yields per acre for Idaho's second most important crop, wheat, also set a record in 2018, and favorable weather and climate conditions were primary reasons for the record crop yield, according to state agriculture officials.⁴⁴

³⁹ Data from National Climatic Data Center, “Historical Palmer Drought Indices,” U.S. National Oceanic and Atmospheric Administration, accessed August 2019, <https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers>. Data graphed by meteorologist Anthony Watts.

⁴⁰ *Ibid.*

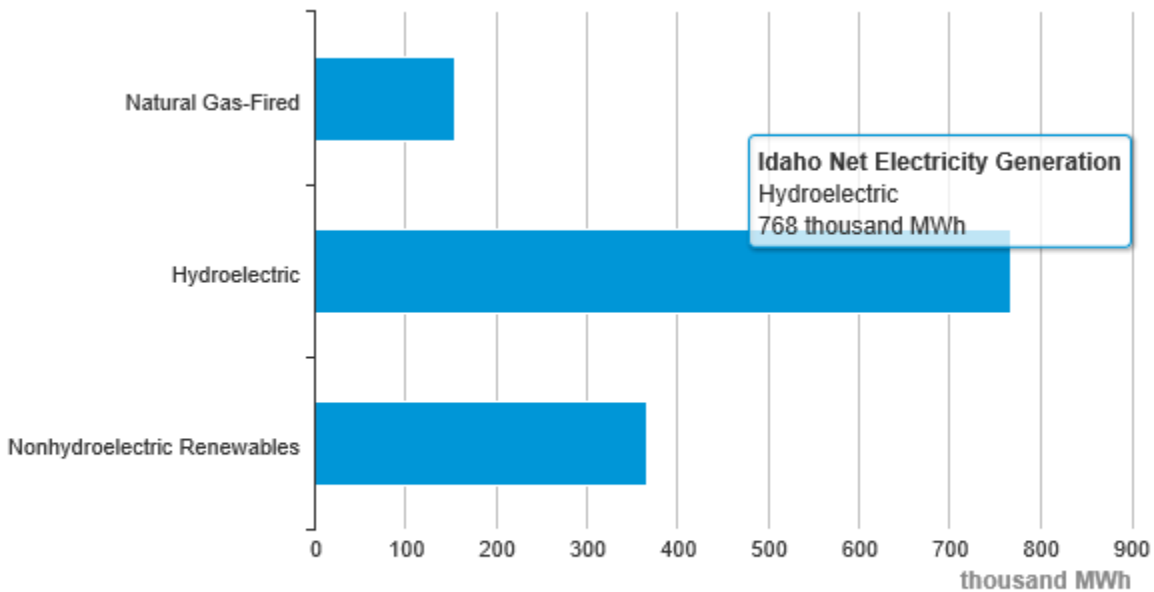
⁴¹ Idaho State Department of Agriculture, “Crops grown in Idaho,” agri.idaho.gov, accessed August 26, 2019, <https://agri.idaho.gov/main/about/about-idaho-agriculture/idaho-crops>

⁴² Spudman.com, “Production for Idaho potato crop yield-per-acre would be best of all time,” November 9, 2018, <https://spudman.com/news/projection-for-idaho-potato-crop-yield-per-acre-would-be-best-of-all-time>

⁴³ Associated Press, “Idaho potatoes set major record last year,” March 8, 2018, https://www.idahostatejournal.com/business_journal/idaho-potatoes-set-major-record-last-year/article_e85aa063-86f8-5920-847e-a7ec6dce398b.html

⁴⁴ Matthew Weaver, “Idaho's wheat crop sets record for yield,” *Capital Press*, October 16, 2018, <https://>

Figure 7: Idaho Net Electricity Generation by Source, April 2019



 Source: Energy Information Administration, *Electric Power Monthly*

Figure 7: Idaho generates the vast majority of its electricity from zero-emissions energy sources. The remainder comes from low-emissions natural gas. Source: U.S. Energy Information Administration, “State Profile and Energy Estimates: Idaho,” *Independent Statistics & Analysis*, accessed August 2019, <https://www.eia.gov/state/?sid=ID#tabs-4>

Idaho’s third most important crop, barley, produced record yields in 2016. The 2017 season also produced very strong yields, but it fell short of the 2016 record because a longer, colder late winter/early spring delayed early season planting.⁴⁵ Modest warming would likely make such planting delays less frequent in future years.

Yields per acre for Idaho’s fourth most important crop, sugar beets, also set a record in 2016. In 2018, by emphasizing sugar content per beet rather than total beet production, Idaho farmers may have set a new record for finished beet sugar.⁴⁶

www.capitalpress.com/nation_world/profit/idaho-s-wheat-crop-sets-record-for-yield/article_7889fcf-5ad4-5bd2-b4d4-0f4a2b92a0c6.html

⁴⁵ Sean Ellis, “Idaho barley growers expect a good crop but not a record in 2017,” *Capital Press*, June 12, 2017, https://www.capitalpress.com/state/idaho/idaho-barley-growers-expect-a-good-crop-but-not-a/article_7c66aef2-f7de-5b8a-8ebe-594166b014b2.html

⁴⁶ John O’Connell, “High beet sugar levels help Amalgamated approach record production,” *Idaho State Journal*, March 8, 2019, https://www.idahostatejournal.com/news/local/high-beet-sugar-levels-help-amalgamated-approach-record-production/article_11d7f69a-c4a5-57f7-95b2-086dfce2dd79.html.

Aside from agriculture, Idaho will likely continue to profit from modest warming in other ways. Satellite measurements of global vegetation intensity show Idaho is benefitting from global greening more than almost any other region of the planet.⁴⁷ Idaho, like the rest of the nation and globe, will also likely continue benefitting from reduced cold temperature-related mortality and decline in extreme weather events. Moreover, a warmer climate would provide greater opportunities for tourism, exercise, and recreation, with longer seasons for hiking, camping, fishing, golfing, bicycle riding, and myriad other outdoor activities.

“EVEN UNDER AN OPTIMISTIC SCENARIO, COMPLETELY ELIMINATING IDAHO CO₂ EMISSIONS WOULD LOWER GLOBAL TEMPERATURE BY ONLY APPROXIMATELY 0.003 DEGREES C BY THE YEAR 2100, AN AMOUNT TOO SMALL TO BE MEASURED OR NOTICED.”

than Idaho.^{48,49} This is largely because emissions-free hydroelectric power provides the majority of Idaho’s electricity. Nonhydroelectric renewables provide the second most electricity production in Idaho, with natural gas providing the third most electricity production. (See Figure 7.) There are no utility-owned coal-fired power plants in Idaho, and there is only one utility-scale coal-fueled industrial facility.⁵⁰ These key facts show Idaho already has an extremely minimal impact on global CO₂.

According to calculations included in the U.S. National Center for Atmospheric Research climate models, a complete elimination of U.S. CO₂ emissions would lower global temperature, versus business-as-usual scenarios, by a mere 0.14 degrees C by the year 2100.⁵¹ Idaho produces less than 2 percent of U.S. CO₂ emissions.⁵² Even under an optimistic scenario, completely eliminating Idaho CO₂ emissions would lower global temperature by only approximately 0.003 degrees C by the year 2100, an amount too small to be measured or noticed.

4. Idaho Energy Use and Impacts

Idaho CO₂ emissions are already among the lowest in the country, both in terms of total emissions and emissions per person. Only 10 states emit less CO₂ per person than Idaho, and only six states emit less total CO₂

⁴⁷ Randall J. Donohue *et al.*, *supra* note 15.

⁴⁸ U.S. Energy Information Administration, “Energy-Related Carbon Dioxide Emission by State, 2005-2016,” *Independent Statistics & Analysis*, <https://www.eia.gov/environment/emissions/state/analysis/>.

⁴⁹ *Ibid.*

⁵⁰ U.S. Energy Information Administration, *supra* note 7.

⁵¹ Patrick J. Michaels and Paul C. Knappenberger, “We Calculate, You Decide: A Handy-Dandy Carbon Tax Temperature Savings Calculator,” *Cato at Liberty*, July 23, 2013, <https://www.cato.org/blog/current-wisdom-we-calculate-you-decide-handy-dandy-carbon-tax-temperature-savings-calculator>

⁵² U.S. Energy Information Administration, *supra* note 48.

Conclusion

Weather and climate data show climate change has had a minimal impact in Idaho, and to the extent modest climate changes have occurred, the bulk of the impacts appear to have been beneficial. Even if Idaho were showing signs

of substantial climate change and/or negative climate change impacts, Idaho has already dramatically curtailed its carbon dioxide emissions, which means state government action to curtail carbon dioxide emissions or otherwise address climate change would have extremely minimal climate impact.

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About the Author

James Taylor is a senior fellow for environment and energy policy at The Heartland Institute and the director of Heartland's Arthur B. Robinson Center on Climate and Environmental Policy.

Taylor is the former managing editor (2001-2014) of *Environment & Climate News*, a national, monthly publication devoted to sound science and free-market environmentalism.

Taylor has presented analyses about energy and environment issues on CNN, CNN Headline News, Fox News Channel, Fox Business Channel, MSNBC, *PBS News Hour*, *PBS Frontline*, *CBS Evening News*, *ABC World News*, and other TV and radio outlets across the country. He has been published in virtually every major newspaper in America.

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