That Stubborn Climate

John R. Christy
Alabama State Climatologist
Director, Earth System Science Center
University of Alabama in Huntsville
Alabama State Climatologist

• Professor at University of Alabama in Huntsville

• Works to utilize climate resources of Alabama for economic development

• Works to protect Alabama’s economy from climate-related regulatory threats that are not based on science
Alabama State Climatologist

- Professor at University of Alabama in Huntsville
- Works to utilize climate resources of Alabama for economic development
- Works to protect Alabama’s economy from climate-related regulatory threats that are not based on science
Alabama State Climatologist

- Professor at University of Alabama in Huntsville
- Works to utilize climate resources of Alabama for economic development
- Works to protect Alabama’s economy from climate-related regulatory threats that are not based on science
El Nino is Here
December 2015 through February 2016
March through May 2016
Turning water into jobs in an environmentally and economically sustainable way
Coffeeville Lock and Dam - unused water is like watching bales of $100 bills float out to sea.
We need to stamp out gambling in Alabama
We need to stamp out gambling in Alabama

The number one gambler in Alabama is the farmer who bets everything he has on the hope that it will rain at the right time.
Coping with Droughts
Alabama Irrigation Initiative

Published: September 22, 2007

Op-Ed Contributor

Let the East Bloom Again

By RICHARD T. McNIDER and JOHN R. CHRISTY
Huntsville, Ala.
Headland, AL 1951 - 1999
Irrigated vs Rainfed

For corn the average difference can be $300 per acre!
Alabama Irrigation Initiative
Irrigation Tax Credit Bill Signed 2011, 2012
Irrigation Tax Credit Bills

- **State “lost”** $1.1M in 2011-2013 as 244 farmers claimed the tax credit to expand irrigation
- State regained this “loss” in increased revenue within two years and will gain 5 to 12 dollars in increased tax revenue for every dollar “lost” to the Education Trust Fund by 2030
Irrigation Tax Credit Bills

- State “lost” $1.1M in 2011-2013 as 244 farmers claimed the tax credit to expand irrigation
- State regained this “loss” in increased revenue within two years and will gain 5 to 12 dollars in increased tax revenue for every dollar “lost” to the Education Trust Fund by 2030
Alabama State Water Plan?

• Alabama has water for everyone and everything most of the time, so access should be expanded

• A plan is simply Adult Supervision during dry spells if greater water-access is allowed

• Plan should protect the economic situation of those hit with restrictions

• Plan should protect environmental flows
Alabama State Water Plan?

- Alabama has water for everyone and everything most of the time, so access should be expanded.
- A plan is simply Adult Supervision during dry spells if greater water-access is allowed.
- Plan should protect the economic situation of those hit with restrictions.
- Plan should protect environmental flows.
Alabama State Water Plan?

- Alabama has water for everyone and everything most of the time, so access should be expanded
- A plan is simply Adult Supervision during dry spells if greater water-access is allowed
- Plan should protect the economic situation of those hit with restrictions
- Plan should protect environmental flows
Alabama State Water Plan?

• Alabama has water for everyone and everything most of the time, so access should be expanded

• A plan is simply Adult Supervision during dry spells if greater water-access is allowed

• Plan should protect the economic situation of those hit with restrictions

• Plan should protect environmental flows
Alabama State Water Plan?

- A Plan means regulation and occasional restrictions
  - Water users hate regulations and restrictions
  - A Plan needs fees to operate
  - Water users hate fees
  - A plan should protect the user and the aquatic life while spurring economic growth
Alabama State Water Plan?

- A Plan means regulation and occasional restrictions
- Water users hate regulations and restrictions
- A Plan needs fees to operate
- Water users hate fees
- A plan should protect the user and the aquatic life while spurring economic growth
Alabama State Water Plan?

• A Plan means regulation and occasional restrictions
• Water users hate regulations and restrictions
• A Plan needs fees to operate
  • Water users hate fees
• A plan should protect the user and the aquatic life while spurring economic growth
Alabama State Water Plan?

- A Plan means regulation and occasional restrictions
- Water users hate regulations and restrictions
- A Plan needs fees to operate
- Water users hate fees
- A plan should protect the user and the aquatic life while spurring economic growth
Alabama State Water Plan?

- *A Plan means regulation and occasional restrictions*
- *Water users hate regulations and restrictions*
- *A Plan needs fees to operate*
- *Water users hate fees*
- *A plan should protect the user and the aquatic life while spurring economic growth*
Climate Change
Alabama is in a desperate fight with the Regulatory activities of the Federal Government regarding “Climate Change”

EPA rules due next week on CO2 to further increase cost of energy and which will not affect the climate
Alabama Factoid

Alabama generates 152.9 million MW-hrs of electricity

Alabama consumes 86.2 million MW-hrs of electricity

Alabama exports 66.7 million MW-hrs to neighbors who buy them (GA, TN mainly).

California generates 199.5 million MW-hrs of electricity

California consumes 259.5 millions MW-hrs of electricity

California imports 60.0 million MW-hrs from neighbors
“America is addicted to oil”

State of The Union Address
Jan 31 2006

President George W. Bush
We are addicted to:

Long life
Good health/Medical advances
Technological Progress
Affordable Services
Freedom of mobility
Abundant and affordable food
Natural landscapes
Clean Water/Air
We are addicted to:

Long life
Good health/Medical advances
Technological Progress
Affordable Services
Freedom of mobility
Abundant and affordable food
Natural landscapes
Clean Water/Air

Affordable Energy
Electrification
Transportation
Industry
We are addicted to:
- Long life
- Good health/Medical advances
- Technological Progress
- Affordable Services
- Freedom of mobility
- Abundant and affordable food
- Natural landscapes
- Clean Water/Air

Affordable Energy
- Electrification
- Transportation
- Industry

Carbon 87% (coal, natural gas, oil)
- Nuclear 9%
- Hydroelectric power 3%
We are addicted to:

- Long life
- Good health/Medical advances
- Technological Progress
- Affordable Services
- Freedom of mobility
- Abundant and affordable food
- Natural landscapes
- Clean Water/Air

**Affordable Energy**

- Electrification
- Transportation
- Industry

- Carbon 87% (coal, natural gas, oil)
- Nuclear 9%
- Hydroelectric power 3%

- CO2: Non-Toxic
- Invigorates Biosphere
- Increases food production
- Climate???

- Carbon 87%
- Nuclear 9%
- Hydroelectric power 3%

- CO2: Non-Toxic
- Invigorates Biosphere
- Increases food production
- Climate????
Climate Change is a Science Issue
All Science is Numbers

Paraphrase of Lord Kelvin (Sir William Thomson)
In science, a fundamental principle is that when you understand a system, you can predict its behavior.

Seasonal Forecast Nov-Jan 2013-14
In science, a fundamental principle is that when you understand a system, you can predict its behavior.

Seasonal Forecast Nov-Jan 2013-14

Actual
How do you test the “Settled Science” of the Administration’s view of Climate Change?

(i.e. the science claim is that the climate system is understood so well that we can predict its behavior.)
A Climate Model Simulation is a Hypothesis – a “claim”

How does one define a falsifiable test for a model hypothesis?
Select a prominent metric that demonstrates the greenhouse effect - test against observations

One such test is to compare global average temperatures in models and in the real world (observations)
History Lesson 1988

GISS-A(88)  GISS-B(88)  GISS-C(88)
This is 2015, and science surely has advanced since 1988. Let us again do a test on the latest model projections used in the latest IPCC AR5 Report.

Another such test is to compare tropical average temperatures in models and in the real world (observations).
Test the Largest Signature of Global Warming that “Settled Science” (model) says is Happening

The most obvious signature of warming due to extra greenhouse gases is the temperature of the tropical troposphere

Cross section of atmosphere

Tropical tropospheric “Hot Spot” is a major signature of GHG response in models
102 CMIP-5 rcp4.5 Model runs in 32 Groups

Tropical Mid-Tropospheric Temp. – The greenhouse “Hot Spot”

5-Year Averages, 1979-2014 Trend line crosses zero at 1979 for all time series

In Science, when we understand a system, we can predict its behavior. If not, we do not understand the system.
Tropical Tropospheric Temperature Trend (°C/decade) 1979-2013, 102 CMIP-5 Models vs. Observations

U.S. spends $10s of millions per year for climate modelers to hit this target (the real world warming rate.)
Tropical Tropospheric Temperature Trend (°C/decade)
1979-2013, 102 CMIP-5 Models vs. Observations

This is the result.

The disturbing implication is that the current understanding of climate sensitivity to CO2 is systematically wrong – all models over predict the warming – so basic claim of “understanding” is wrong.
Global Mid-Tropospheric Temperature Change 1979-2025 °C
Average 102 Climate Model Simulations (rcp4.5) vs. Satellite and Balloon Observations 1979-2014

Average of 102 IPCC CMIP-5 Climate Models

The linear trend (based on 1979-2014 only) of all time series intersects at zero at 1979

JR Christy. Univ. Alabama in Huntsville
Model output: KNMI Climate Explorer
"The temperature around the globe is increasing faster than was predicted just 10 years ago", President Obama Nov. 14 2012
The evidence clearly demonstrates that there is a fundamental problem with the current understanding of the climate system (all models fail in the same direction). The current models fail significantly (a scientific demonstration of falsifiability) in depicting how the global climate system works.

If the models can’t tell us what has happened, how can they tell us why it happened (i.e. CO2 emissions)? They should not be used for policy.
The evidence clearly demonstrates that there is a fundamental problem with the current understanding of the climate system (all models fail in the same direction). The current models fail significantly (a scientific demonstration of falsifiability) in depicting how the global climate system works.

If the models can’t tell us what has happened, how can they tell us why it happened (i.e. CO2 emissions)? They should not be used for policy.
Evidence?
Disappearing Snow and Sea Ice
Northern Hemisphere SnowExtent
November to April

Record Coverage 2012-13

Million sq. km

FAQ 4.1, Figure 1 | The mean circulation pattern of sea ice and the decadal trends (%) in annual anomalies in ice extent (i.e., after removal of the seasonal cycle), in different sectors of the Arctic and Antarctic. Arrows show the average direction and magnitude of ice drift. The average sea ice cover for the period 1979 through 2012, from satellite observations, at maximum (minimum) extent is shown as orange (grey) shading.

Arctic Downward

Antarctic Upward

Sea Ice Changes 1979-2012
Global Sea Ice is at the long-term average as of 30 Aug 2015
[2014 Antarctic Sea Ice coverage has set daily records]

Cryosphere Today, Chapman, U. Illinois
Evidence?

Extreme Weather
Global Hurricanes (1971 to April 2015)

Global Tropical Cyclone Frequency -- 12 month Running Sums -- Dr. Ryan N. Maue -- Updated April 30, 2015
U.S. Annual Count of EF-1+ Tornadoes, 1954 through 2012

(2013 Preliminary, will decline as duplicates removed)

Data Source: NOAA/NWS Storm Prediction Center
Monthly Fraction of US with Very Wet (floods) or Very Dry (drought) Conditions
Jan 1895 – Feb 2015 NOAA/NCDC
Global Drought Indices 1982-2012

Hao et al. 2014
Fraction of Daily High Temperatures at 982 USHCN Stations exceeding 100°F per year 1895-2014
Alabama Summer Daily Maximum Temperature
Average of 4, 100-mile-diameter regions centered on MOB, MGM, BHM and HSV, 1883-2014

J. Christy Alabama State Climatologist,
The University of Alabama in Huntsville
Views of “dangerous” Climate Change rely on models that fail simple testing and are not based on the evidence we have
How Did We Get to the point in which EPA was given the authority to Regulate CO2?
Clever Path

• Enable “friendly” advocacy groups to sue the federal government in friendly courts for not protecting the environment

• Put sympathetic authors of science “finding” reports in the agencies thus controlling the “science”

• Courts defer to agencies for scientific guidance (i.e. “science” is not presented at trial)

• Courts rule in favor of the advocates

• The regulatory agency (i.e. EPA, DOI) is granted authority to write significant rules to change the energy economy without attention to science, cost and benefit
Clever Path

• Enable “friendly” advocacy groups to sue the federal government in friendly courts for not protecting the environment

• Put sympathetic authors of science “finding” reports in the agencies thus controlling the “science”

• Courts defer to agencies for scientific guidance (i.e. “science” is not presented at trial)

• Courts rule in favor of the advocates

• The regulatory agency (i.e. EPA, DOI) is granted authority to write significant rules to change the energy economy without attention to science, cost and benefit
Clever Path

• Enable “friendly” advocacy groups to sue the federal government in friendly courts for not protecting the environment
• Put sympathetic authors of science “finding” reports in the agencies thus controlling the “science”
• Courts defer to agencies for scientific guidance (i.e. “science” is not presented at trial)
  • Courts rule in favor of the advocates
• The regulatory agency (i.e. EPA, DOI) is granted authority to write significant rules to change the energy economy without attention to science, cost and benefit
Clever Path

- Enable “friendly” advocacy groups to sue the federal government in friendly courts for not protecting the environment
- Put sympathetic authors of science “finding” reports in the agencies thus controlling the “science”
- Courts defer to agencies for scientific guidance (i.e. “science” is not presented at trial)
- Courts rule in favor of the advocates
  - The regulatory agency (i.e. EPA, DOI) is granted authority to write significant rules to change the energy economy without attention to science, cost and benefit
Clever Path

- Enable “friendly” advocacy groups to sue the federal government in friendly courts for not protecting the environment
- Put sympathetic authors of science “finding” reports in the agencies thus controlling the “science”
- Courts defer to agencies for scientific guidance (i.e. “science” is not presented at trial)
- Courts rule in favor of the advocates
- The regulatory agency (i.e. EPA, DOI) is granted authority to write significant rules to change the energy economy without attention to science, cost and benefit
We do not believe any group of men [is] adequate enough or wise enough to operate without scrutiny or without criticism.

We know that the only way to avoid error is to detect it, that the only way to detect it is to be free to inquire.

We know that in secrecy error undetected will flourish and subvert.

– J Robert Oppenheimer
Climate Change is a Political Issue
House Science, Space and Technology Committee
11 Dec 2013

Senate Environment and Public Works Committee
1 Aug 2012

House Committee on Natural Resources
13 May 2015
The science is unequivocal, and those who refuse to believe it are simply burying their heads in the sand. We don’t have time for a meeting anywhere of the Flat Earth Society. And in a sense, climate change can now be considered another weapon of mass destruction, perhaps the world’s most fearsome weapon of mass destruction. – John Kerry
Feb 16 2014
Climate Change is a Political Agenda

McNider and Christy: Why Kerry Is Flat Wrong on Climate Change

It was the scientific skeptics who bucked the 'consensus' and said the Earth was round.

U.S. Secretary of State John Kerry during a speech on climate change in Jakarta on Sunday. Agence France-Presse/Getty Images

Warming Predictions vs. the Real World

Global mid-tropospheric temperature 5-year averages, in degrees Celsius

- Average of 102 model runs
- Average of four balloon datasets
- Average of two satellite datasets

* The linear trend of all three curves intersects at zero in 1979, with the values shown as departures from that trend line.

Sources: Various, as described in the "State of the Climate in 2012" in the Bulletin of the American Meteorological Society, August 2013
Though Scorned by Colleagues, a Climate-Change Skeptic Is Unbowed
Arizona congressman asking questions about outside funding for UAH climate expert John Christy

A U.S. Congressman from Arizona is requesting information from the University of Alabama in Huntsville about outside funding sources of John Christy, director of the school's Earth System Science Center.

Arizona Democrat Raul Grijalva sent a letter dated Tuesday to UAH President Robert Altenkirch about Christy - an outspoken critic of climate change governmental policies.

Altenkirch's chief of staff, Ray Garner, said the school has not received the letter.

The letter to UAH outlines a New York Times report that said Willie Soon, a scientist at the Harvard-Smithsonian Center for Astrophysics, has received more than $1.2 million from the fossil fuel industry. The Times article said he has frequently omitted that information.

Soon is considered a skeptic that climate change is harmful. Grijalva, the ranking member of the House Natural Resources Committee and a proponent of President Obama's efforts to address climate change, sent letters to seven climate experts asking about outside funding that could influence their testimonies before Congress as well as their research.

All seven climate experts who received letters are considered opponents to the belief of the harmful effects of climate change, The Washington Post reported.

"The whole reason we sent the letter is because we don't know (about Christy's possible outside funding)," said Adam Sarvana, communications director for Natural Resources Committee's Democratic delegation.

"The way we chose the list of recipients is who has published widely, who has testified in Congress before, who seems to have the most impact on policy in the scientific community and he definitely fits that bill. He was profiled in The New York Times."

"The way we chose the list of recipients is who has published widely, who has testified in Congress before, who seems to have the most impact on policy in the scientific community and he definitely fits that bill. He was profiled in The New York Times."

Congress of the United States
Washington, DC 20515
Feb. 24, 2015

Robert A. Altenkirch
President, The University of Alabama in Huntsville
Shelby King Hall, room 374
Huntsville, AL 35899

Dear President Altenkirch:

As Ranking Member of the House Committee on Natural Resources, I have a constitutional duty to protect the public lands, waters, and resources of the United States and ensure that taxpayers are able to enjoy them. I write today because of concerns raised in a recent New York Times report and documents I have received that highlight potential conflicts of interest and failure to disclose corporate funding sources in academic climate research. Understanding climate change and its impacts on federal property is an important part of the Committee's oversight plan.

As you may have heard, the Koch Foundation appears to have funded climate research by Dr. Willie Soon of the Harvard-Smithsonian Center for Astrophysics, some of which formed the basis of testimony before the U.S. House Committee on Science, Space, and Technology and the Kansas State Legislature's House Energy and Environment Committee — funding that was not disclosed at the time. ExxonMobil, in response to an inquiry from the House Science Committee, may have provided false or misleading information on its funding for Dr. Soon's work. Southern Services Company funded Dr. Soon's authorship of several published climate studies, Dr. Soon did not disclose this funding to many of those journals' publishers or editors.

If true, these may not be isolated incidents. Professor John Christy at the Earth System Science Center has testified many times before the U.S. Congress on climate change. His December 2013 testimony to the House Committee on Science, Space and Technology and the Nobel Prize-winning U.N. Intergovernmental Panel on Climate Change, "We need to put down the IPCC as soon as possible — not to protect the patient who seems to be thriving in its own little cocoon, but for the sake of the rest of us whom it is trying to infect with its disease. Fortunately most of the population seems to be immune, but some governments seem highly susceptible to the disease."
Will Regulations make a difference?
If the U.S.A. ceased to exist in 2012, the impact on global temperatures (if IPCC models are accepted) would be 0.08°C by 2050, or less than the thickness of the line.

The irony is that even if you accept the latest climate model simulations, they show that the US will have little impact on whatever the temperature evolution does over the next century.

Data from SPPI, Paul Knappenberger
Scientific method shows:

Regulations that impose higher energy costs will do nothing perceptible or attributable to whatever the climate is going to do.
The Real World Happens
Law of Sustainability

If it’s not economically sustainable, it’s not sustainable.
Law of Sustainability

If it’s not economically sustainable, it’s not sustainable.
The Real World Happens - Germany

- Germany desired to be the number one example of environmental sustainability
- Spent > 100 billion on solar and wind generation which required huge subsidies
- Electric rates rose to $0.34 kw-hr
- Country became uncompetitive, 6.9 million households in energy poverty in 2013
- Subsidies are being reduced
- CO2 emissions in Germany are rising
The Real World Happens - Germany

- Germany desired to be the number one example of environmental sustainability
- Spent > 100 billion on solar and wind generation which required huge subsidies
  - Electric rates rose to $0.34 kw-hr
  - Country became uncompetitive, 6.9 million households in energy poverty in 2013
  - Subsidies are being reduced
  - CO2 emissions in Germany are rising
The Real World Happens - Germany

• Germany desired to be the number one example of environmental sustainability
• Spent > 100 billion on solar and wind generation which required huge subsidies
• Electric rates rose to $0.34 kw-hr
  • Country became uncompetitive, 6.9 million households in energy poverty in 2013
• Subsidies are being reduced
• CO2 emissions in Germany are rising
The Real World Happens - Germany

- Germany desired to be the number one example of environmental sustainability
- Spent > 100 billion on solar and wind generation which required huge subsidies
- Electric rates rose to $0.34 kw-hr
- Country became uncompetitive, 6.9 million households in energy poverty in 2013
  - Subsidies are being reduced
  - CO2 emissions in Germany are rising
The Real World Happens - Germany

• Germany desired to be the number one example of environmental sustainability
• Spent > 100 billion on solar and wind generation which required huge subsidies
• Electric rates rose to $0.34 kw-hr
• Country became uncompetitive, 6.9 million households in energy poverty in 2013
• Subsidies are being reduced
  • CO2 emissions in Germany are rising
The Real World Happens - Germany

- Germany desired to be the number one example of environmental sustainability
- Spent > 100 billion on solar and wind generation which required huge subsidies
- Electric rates rose to $0.34 kw-hr
- Country became uncompetitive, 6.9 million households in energy poverty in 2013
- Subsidies are being reduced
- CO2 emissions in Germany are rising
Helping the poor means lowering energy costs
Hurting the poor means increasing energy costs

Source: American Association of Blacks in Energy

1. All cost data from EIA 2010
2. Installed coal costs estimated from EIA projections for new generation less capital costs
3. Retrofit coal capital costs derived from Burns & McDonnell analysis December 2010

The drive to renewables in Germany should run counter to maintaining a high dependency on coal, but (and some may say hypocritically) Germany has five new coal-fired power plants with a combined capacity of around 4 GW going through their “first fire” trials this summer. Overall, Germany’s coal-fired power plants (including lignite) contributed more than 50% to the nation’s electricity demand in the first half of this year, with more coal-fired capacity likely to be commissioned before the first nuclear plant is taken out of service in 2015. --Stuart Burns, Metal Miner, 22 October 2013
Japan has **43 coal fired power plants** under construction or planned to provide the dominant source of energy for electricity. *Bloomberg* 9 April 2015
The Real World Happens – Developing World

• Affordable energy vastly improves the quality and length of human life

• The most affordable path to energy is carbon combustion

• U.S. share of world CO2 emissions has fallen from 28 percent in 1990s to 16 percent today to 13 percent by 2040.
The Real World Happens – Developing World

• Affordable energy vastly improves the quality and length of human life
• The most affordable path to energy is carbon combustion
• U.S. share of world CO2 emissions has fallen from 28 percent in 1990s to 16 percent today to 13 percent by 2040.
The Real World Happens – Developing World

- Affordable energy vastly improves the quality and length of human life
- The most affordable path to energy is carbon combustion
- U.S. share of world CO2 emissions has fallen from 28 percent in 1990s to 16 percent today to 13 percent by 2040.
To value human life means avoiding this energy system.
This energy system ...

CO2 Emissions EIA 2013 Outlook
(million metric tons CO2)

China and India
U.S.

2013: US 16.5% total global emissions
2025: US 14.1%
2040: US 12.5%

... is better than this Energy System

Energy Source

Energy Transmission

Energy Use
The increase alone in hydrocarbon usage from 2012 to 2013 provided more energy than all of wind and solar combined (BP Report June 2014)

Coal – no one is following the U.S. example
The Moral Issue
What is the value of human life?
We are addicted to:

- Long life
- Good health/Medical advances
- Technological Progress
- Affordable Services
- Freedom of mobility
- Abundant and affordable food
- Natural landscapes
- Clean Water/Air

Affordable Energy

- Electrification
- Transportation
- Industry

Carbon 87%
(coal, natural gas, oil)

Nuclear 9%

Hydroelectric power 3%

CO2: Non-toxic
Invigorates Biosphere
Increases food production
Basis for Human Progress
Climate????

Value of Human Life?
A high value on Human Life means moving people up on the energy curve.

Source: World Resources Institute, IEEE Spectrum
Scatterplot, Electricity Cost vs. Installed Renewable Capacity

Trend = 0.02 cents/kilowatt-hour per additional kW of capacity
R^2 = 0.84, p-value = 1.5E-8
Helping the poor means lowering energy costs
Hurting the poor means increasing energy costs

Source: American Association of Blacks in Energy
Law of Sustainability

What [CO2] cuts? That’s for more developed countries. The moral principle of historic responsibility cannot be washed away. India’s first task is eradication of poverty. Twenty percent of our population doesn’t have access to electricity, and that’s our top priority. We will grow faster, and our CO2 emissions will rise.

Law of Sustainability

If it’s not economically sustainable, it’s not sustainable.

Lifting people out of energy poverty with carbon is morally right and is going to keep happening everywhere else no matter what the U.S. does
What do the numbers show?

The scientific method demonstrates the current theory of CO2 warming of the climate is out of step with reality.

The extreme weather events we care about are not increasing in frequency or intensity.

Punitive regulatory controls will do essentially nothing to change whatever the climate is going to do.

CO2-emitting Coal is increasingly powering the world’s economies, including Germany’s and Japan’s along with developing countries, no matter what the U.S. says.
What do the numbers show?

The scientific method demonstrates the current theory of CO2 warming of the climate is out of step with reality.

The extreme weather events we care about are not increasing in frequency or intensity.

Punitive regulatory controls will do essentially nothing to change whatever the climate is going to do.

CO2-emitting Coal is increasingly powering the world’s economies, including Germany’s and Japan’s along with developing countries, no matter what the U.S. says.
What do the numbers show?

The scientific method demonstrates the current theory of CO2 warming of the climate is out of step with reality.

The extreme weather events we care about are not increasing in frequency or intensity.

Punitive regulatory controls will do essentially nothing to change whatever the climate is going to do.

CO2-emitting Coal is increasingly powering the world’s economies, including Germany’s and Japan’s along with developing countries, no matter what the U.S. says.
What do the numbers show?

The scientific method demonstrates the current theory of CO2 warming of the climate is out of step with reality.

The extreme weather events we care about are not increasing in frequency or intensity.

Punitive regulatory controls will do essentially nothing to change whatever the climate is going to do.

CO2-emitting Coal is increasingly powering the world’s economies, including Germany’s and Japan’s along with developing countries, no matter what the U.S. says.
What does my experience say?

Climate Change is a political issue and there is a cost for those of us who are not politically correct

If there is value in enhancing the quality and length of human life, the moral imperative is to expand access to low-cost, carbon-based energy. This is happening anyway.
What does my experience say?

Climate Change is a political issue and there is a cost for those of us who are not politically correct.

If there is value in enhancing the quality and length of human life, the moral imperative is to expand access to low-cost, carbon-based energy. This is happening anyway.