

In The
Supreme Court of the United States

SOUTHEASTERN LEGAL FOUNDATION, INC., ET AL.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL.

TEXAS, ET AL.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL.

CHAMBER OF COMMERCE OF THE UNITED STATES, ET AL.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL.

**ON PETITION FOR A WRIT OF CERTIORARI
TO THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT**

**BRIEF OF AMICI CURIAE SCIENTISTS IN
SUPPORT OF THE PETITIONS FOR CERTIORARI**

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INTEREST OF AMICI CURIAE¹

Amici curiae are well-qualified climate scientists. Amici include respected professors and scientists who have worked for government agencies, universities, and businesses. These highly regarded scientists have expertise in a wide array of fields implicated by this rulemaking, including climate research, weather modeling, physics, geology, statistical analysis, and engineering. They have many publications in peer-reviewed journals and are respected in their fields of expertise by their peers.

Amici wish to present to this Court scientific data that bear directly on the underlying rulemaking. Specifically, amici submit that EPA's finding of human-caused global warming is not supported by the evidentiary record that was before EPA.

¹ Pursuant to Supreme Court Rule 37.6, counsel for amici certifies that this brief was not authored in whole or in part by counsel for any party, and no person or entity other than amici or their counsel has made a monetary contribution to the preparation or submission of this brief. Pursuant to Rule 37.3(a), counsel of record for all parties received notice at least 10 days prior to the due date of the amici curiae's intention to file this brief. All parties have consented to the filing of this brief. Those consents are being lodged herewith. Blanket consents are also already on file with the Clerk.

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SUMMARY OF THE ARGUMENT

In the midst of an unsettled and vigorous international debate regarding the existence of purported global warming and the role—if any—of human-emitted greenhouse gases (GHGs) in contributing to that alleged warming, EPA concluded with near absolute certainty that temperatures in the second half of the twentieth century were “unusually” high because of anthropogenic greenhouse gases. 74 Fed. Reg. 66518 (2009). That sweeping conclusion was a critical component of the EPA's Endangerment Finding, and so was an impetus for the most significant and far-reaching regulatory program ever devised by a federal agency.

Amici urge the Court to grant petitioners' request for certiorari because the three “lines of evidence” from the administrative record that EPA relied on do not support the conclusion that manmade greenhouse gas emissions have caused climate warming in the latter half of the twentieth

century. Indeed, each line of evidence is demonstrably invalid.

EPA's first line of evidence, its purported basic physical understanding of the effect of GHGs and other factors on climate, is invalid because it relies on the existence of an atmospheric "hot spot" or "fingerprint" that simply does not exist in the real world's temperature data. Its second line of evidence, the assertion that temperatures around the globe rose to unusual and dangerously high levels over the last fifty years, is also demonstrably false using the best temperature data available. Likewise, EPA's third line of evidence, involving computerized climate models, is also invalid. It can be shown that those models, premised on faulty assumptions, just do not produce forecasts that match up with the real world.

No specialized scientific education or previous experience with climate science is needed to see that those facts are true. Each of EPA's lines of evidence requires that the most relevant and credible temperature data available show upward-sloping trends in temperature. That is true for the Hot Spot or GHG Fingerprint theory, the assertion that worldwide temperatures have been anomalous, and for actual data to conform to EPA's model forecasts of rising global average surface temperature (GAST). In science, theories must be validated against the most credible

empirical data. Each of EPA's three lines of evidence will be shown to be invalid via such easy to understand hypothesis testing.

EPA reached its invalid conclusions through a highly deficient process. EPA refused to examine "relevant data," *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 513 (2009) (quoting *Motor Vehicles Mfrs. Assn. of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983)), and made other procedural errors. EPA's Endangerment Finding is not "rational," but arbitrary and capricious. *Fox*, 556 U.S., at 516. Amici therefore respectfully request that this Court grant petitioners' request for certiorari in this case.

REASONS FOR GRANTING THE PETITIONS

Amici agree with petitioners, Judges Kavanaugh and Brown, and EPA itself, that this Court's holding in *Massachusetts v. EPA*, 549 U.S. 497 (2007), did not compel EPA to make its Endangerment Finding regarding so-called greenhouse gas (GHG) emissions. See Order, at 2, 8-9, 11-12, *Coalition for Responsible Regulation, Inc. v. Environmental Protection Agency*, No. 09-1322 (CADC Dec. 20, 2012), ECF No. 1411145 (Brown, J., dissenting from denial of rehearing en banc), *Id.*, at 2-3 (Kavanaugh, J., dissenting from denial of rehearing en banc). In any event, in reaching its finding, EPA, quite simply, got the science wrong. That fact is demonstrable from

the very data on which EPA relied, and it is confirmed by data and other input EPA refused to consider in what was an arbitrary and capricious process. The scientific evidence shows that EPA's conclusion that human-caused CO₂ emissions are warming the globe is invalid.

I. THE CONCLUSION THAT EPA DREW FROM ITS THREE LINES OF EVIDENCE IS DEMONSTRABLY INVALID.

EPA grounded its controversial near-certain conclusion that manmade GHG emissions contributed to observed warming in the latter half of the twentieth century on three “lines of evidence” in the administrative record: (1) a “basic physical understanding” of the impacts of various changes—both natural and manmade—on the climate system, (2) historical estimates allegedly suggesting that recent changes in global surface temperature are unusual, (3) and computer-based models simulating the climate's likely response to various forcing mechanisms. 74 Fed. Reg. 66518 (2009).

Not one of these lines, however, supports EPA's ultimate conclusion, much less the degree of certainty asserted by EPA. The significance of the flaws in the bases for EPA's contentions should not be understated. EPA's expansive GHG regulation program is unprecedented by any agency regulatory program in size and scope. Because evidence EPA had available to it

contradicts EPA's ultimate conclusion, its corresponding sweeping actions are arbitrary and capricious.

In the view of many scientists, including amici, there is ample evidence that EPA's Endangerment Finding is grossly flawed. In its finding, EPA relied on the claim by the United Nations' Intergovernmental Panel on Climate Change (IPCC) of 90-99% certainty that observed warming in the latter half of the twentieth century resulted from human activity. See *id.* & n.22. EPA bases its Endangerment Finding on three "lines of evidence." 74 Fed. Reg. 66518. But, using the most credible empirical data available, each of EPA's three lines of evidence should be soundly rejected.

EPA's purported three lines of evidence are summarized below:

1. The first line of evidence is EPA's "basic physical understanding of the effects of changing concentrations of greenhouse gases, natural factors, and other human impacts on the climate system." *Ibid.* EPA is here referring to its GHG Fingerprint (or Hot Spot) Theory, which is that, in the Tropics, the upper troposphere is warming faster than the lower troposphere and the lower is warming faster than the surface, all due to rising atmospheric CO₂ concentrations blocking heat transfer into outer space. By this mechanism,

increasing CO₂ concentration is assumed to increase surface temperatures.

2. The second line of evidence consists of “indirect, historical estimates of past climate changes that suggest that the changes in global surface temperature over the last several decades are unusual.” *Ibid.* This line of evidence refers to EPA’s claim that GAST has been rising in a dangerous fashion over the last fifty years. *Ibid.*

3. EPA referenced as its third line of evidence the “use of computer-based climate models to simulate the likely patterns of response of the climate system to different forcing mechanisms (both natural and anthropogenic).” *Ibid.* Those climate models assume that CO₂ is a key determinant of climate change, and EPA’s conclusions rely on such models to provide forecasts of future temperature conditions that are adequate for regulatory policy analysis.

In fact, however, highly credible empirical temperature data facts, readily available to EPA prior to its endangerment finding invalidate each line of evidence. And temperature data that is now available for the years 2009-2012 further confirms that each line of evidence was invalid.

A. First Line Of Evidence: EPA’s GHG Fingerprint (Or Hot Spot) Theory

The GHG Fingerprint (or Hot Spot) Theory is that in the Tropics, the upper troposphere is

warming faster than the lower troposphere, and the lower troposphere is warming faster than the surface, all due to rising atmospheric CO₂ concentrations. See 74 Fed. Reg. 66522 (2009); Brief of Amici Curiae Scientists in Support of Petitioners Supporting Reversal, at 28-29, *Coalition for Responsible Regulation, Inc. v. Environmental Protection Agency*, No. 09-1322 (CADC June 8, 2011), ECF No. 1312291; see also U.S. Climate Change Science Program and the Subcommittee on Global Change Research, Temperature Trends in the Lower Atmosphere: Steps for Understanding and Reconciling Differences, at 112-116 (Apr. 2006), *available at* <http://www.climatechange.gov/Library/sap/sap1-1/finalreport/sap1-1-final-all.pdf>. That theory is totally at odds with multiple robust, consistent, independently derived empirical data sets that show no statistically significant positive (or negative) trend in temperature and thus no statistically significant differences in trend line slopes by altitude. Brief of Amici Curiae Scientists in Support of Petitioners Supporting Reversal, at 30-34, *Coalition for Responsible Regulation, Inc. v. Environmental Protection Agency*, No. 09-1322 (CADC June 8, 2011), ECF No. 1312291.

For example, balloon data from the Met Office Hadley Centre (Figure 1a), satellite data regarding temperature in the tropical troposphere from the University of Alabama in Huntsville (UAH)

(Figure 1b), and central Pacific Ocean tropical temperature data from the National Oceanic and Atmospheric Administration (NOAA) (Figure 2) are shown below. None of the three has a statistically significant trend line slope. That is, their trend lines are all flat. All temperature data are shown as “anomalies,” where anomalies are computed by subtracting a base period average from actual annual temperature values, both measured in degrees Celsius.

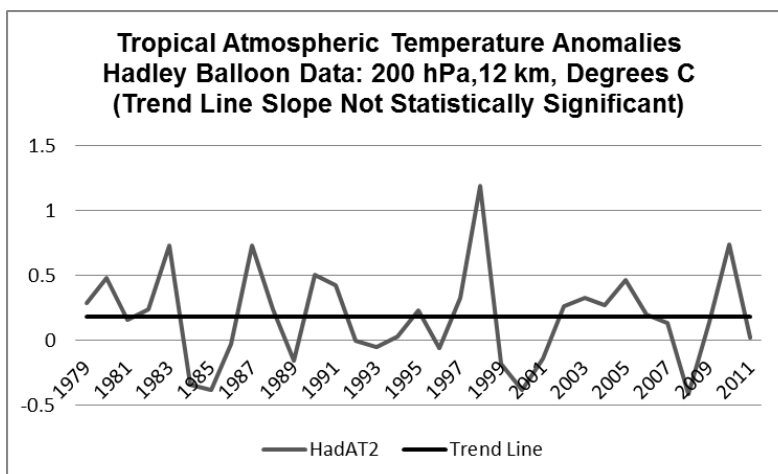


Figure 1a, see Met Office, Global Means Anomaly Series, *available at* http://www.metoffice.gov.uk/hadobs/hadat/hadat2/hadat2_monthly_global_mean.txt (last visited May 17, 2013) (Tropical Atmospheric Temperature Anomalies Hadley Balloon Data: 200 hPa, 12 km, Degrees C).

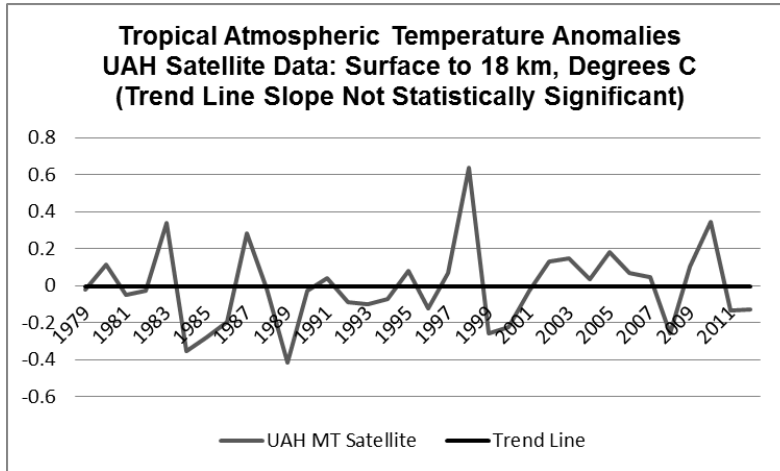


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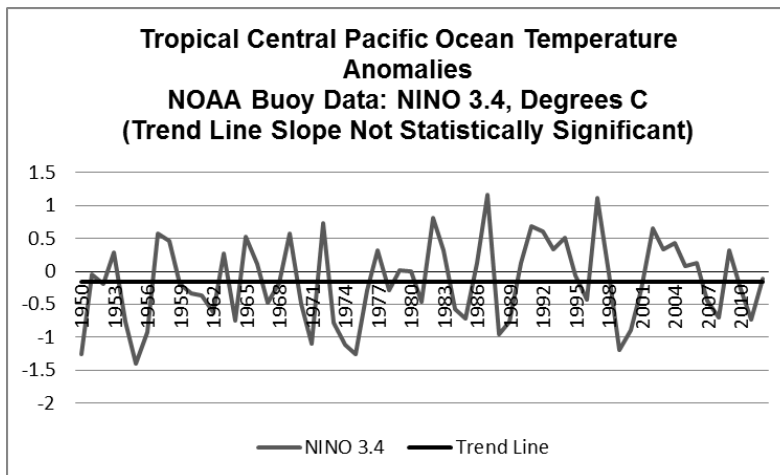


Figure 2, see National Weather Ctr. Climate Prediction Ctr., Tropical Center Pacific Ocean Temperature Anomalies NOAA Buoy Data: NINO 3.4, Degrees C, *available at* <http://www.cpc.ncep.noaa.gov/data/indices/ersst3b.nino.mth.81-10.ascii> (last visited May 17, 2013).

All three figures above show data through the most recent period available, 2012. In December 2009, when EPA issued its Endangerment Finding, the trends in all three were also flat based on annual data through 2008. The more recent data simply reconfirms those three flat trend facts. For EPA's assumed theory to be valid, all three temperature trend lines would have to be upward sloping, but with the Upper Troposphere Trend Line (Figure 1a) steeper than the Mid-troposphere Trend Line (Figure 1b), and that trend line steeper than the Pacific Ocean Temperature Trend Line (Figure 2).

There is no longer any doubt that the purported tropical "hot spot" simply does not exist. Thus, EPA's theory as to how CO₂ affects GAST—EPA's first line of evidence—must be rejected.

B. Second Line Of Evidence: The Purported Unusual Rise In GAST

EPA's second line of evidence is its claim that GAST has been rising in a dangerous fashion over the last fifty years. 74 Fed. Reg. 66518 (2009). EPA goes on to conclude that the alleged rise was

in large part due to human-caused increases in atmospheric CO₂ concentrations. But the purported “global warming” has not been global and has not set records in the regions where the most significant warming has occurred. For example, over the relevant time period, while the Arctic has warmed, tropical oceans had a flat trend, Brief of Amici Curiae Scientists in Support of Petitioners Supporting Reversal, at 17-19, *Coalition for Responsible Regulations, Inc. v. Environmental Protection Agency*, No. 09-1322 (CADC June 8, 2011), ECF No. 1312291, and the Antarctic was slightly cooling, *id.*, at 14-15. The most significant warming during this period occurred in the Northern Hemisphere, north of the Tropics (i.e., north of 20° north). Figure 3 depicts UAH satellite data showing that warming:

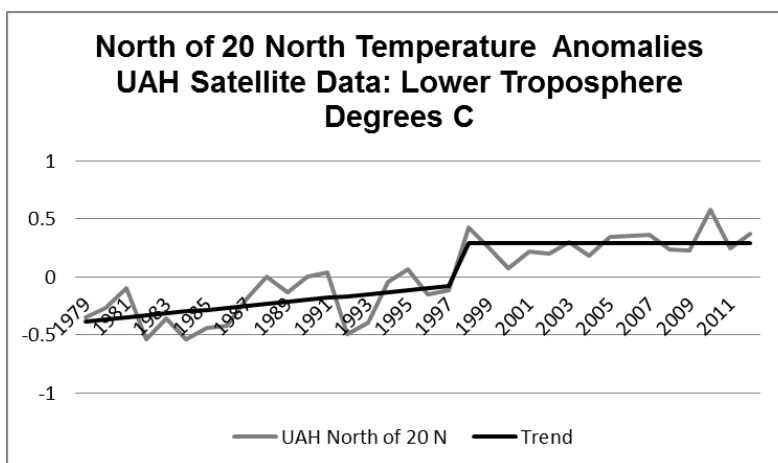


Figure 3, see National Space Sci. & Tech. Ctr., North of 20 North Temperature Anomalies UAH

Satellite Data: Lower Troposphere Degrees C, *available at* <http://vortex.nsstc.uah.edu/data/msu/t2lt/uahncdc.lt> (last visited May 17, 2013).

As is obvious in Figure 3, however, even though the Northern Hemisphere north of the Tropics has warmed, temperatures have leveled off since 2000. That leveling off should have been obvious to EPA prior to its Endangerment Finding in late 2009.

Further, over the last 130 years, the decade of the 1930s still has the most currently held high-temperature records for States within the United States, as shown in Figure 4 below. Fully 70 percent of the current high-temperature records remain before 1940. And, in every decade from 1960 to 2010, there were considerably more cold records set than hot records.

Number of State Record High & Low Temperatures by Decade

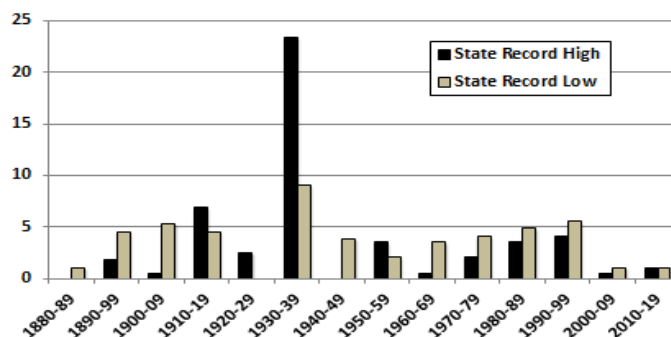


Figure 4, see NOAA National Climatic Data Ctr., State Climate Extremes Committee, Records, *available at* <https://www.ncdc.noaa.gov/extremes/scec/records> (last visited May 17, 2013).

Those data thus demonstrate that EPA's second line of evidence—the claim that there has been unusual warming on a global, that is, worldwide, basis over the past several decades—is invalid.

C. Third Line Of Evidence: Climate Models

EPA's third line of evidence relies on claims that climate-forecasting models that assume CO₂ is a key determinant of climate change can be trusted to provide forecasts of future conditions that are adequate for policy analysis. EPA relied entirely on IPCC climate models predicated on the (as discussed above) invalid Greenhouse Gas Fingerprint Theory. EPA, Climate Change, Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, at ES 3 (Dec. 7, 2009), *available at* <http://www.epa.gov/climatechange/endangerment/index.html#tsd>; IPCC AR4 WG1 §9.2.2, Figure 9.1 and accompanying text *available at* Intergovernmental Panel on Climate Change, IPCC, Fourth Assessment Report: Climate Change 2007, Contribution of Working Group I: The Physical Science Basis, 9.2.2, at 674-676,

http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch9s9-2-2.html (last visited May 17, 2013). Those models fail standard model-validation and forecast-reliability tests. Brief of Amici Curiae Scientists in Support of Petitioners Supporting Reversal, at 34-37, *Coalition for Responsible Regulation, Inc. v. Environmental Protection Agency*, No. 09-1322 (CADC June 8, 2011), ECF No. 1312291.

The models on which EPA relied all forecast rising temperatures assuming continued increases in CO₂ emissions. EPA, Climate Change, Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, at ES 3 (Dec. 7, 2009), *available at* <http://www.epa.gov/climatechange/endangerment/index.html#tsd>. In 2007, IPCC provided four different model forecast scenarios. IPCC AR4 WG1 TS Figure TS.26, p. 69 or Intergovernmental Panel on Climate Change, IPCC, Fourth Assessment Report: Climate Change 2007, Contribution of Working Group I: The Physical Science Basis, TS.3.1.1, at 37, *available at* http://www.ipcc.ch/publications_and_data/ar4/wg1/en/figure-ts-6.html.

Figure 5 below shows those four forecast scenarios (in various shades of grey). Three of them call for a dramatic rise in GAST because they assume CO₂ levels will continue to rise rapidly. The “Commit-Stop CO₂” scenario

portrayed in the chart (in the lightest grey) assumes a draconian curtailment of worldwide CO₂ emissions at the year 1992 level. All of these forecasts were based on the—still missing—greenhouse gas fingerprint or hot spot.

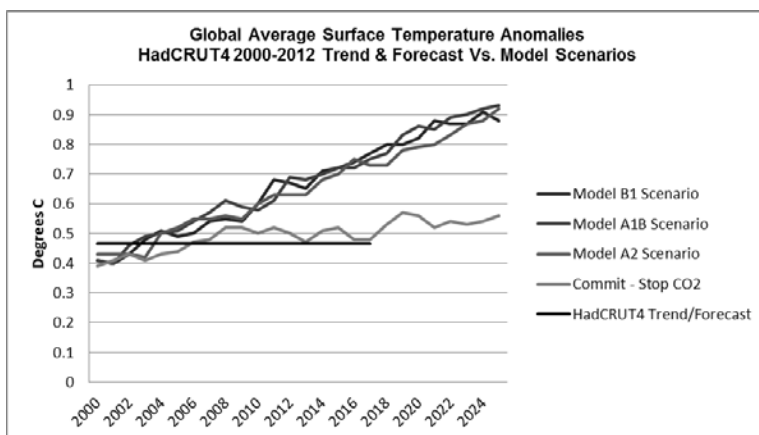


Figure 5. see Intergovernmental Panel on Climate Change, IPCC, Fourth Assessment Report: Climate Change 2007, Contribution of Working Group I: The Physical Science Basis, 9.2.2, at 674-676, http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch9s9-2-2.html; see also Met Office, Met Office Hadley Centre Observations Datasets, available at <http://www.metoffice.gov.uk/hadobs/hadcrut4/data/current/download.html> (last visited May 17, 2013).

A model is only as good as the accuracy of its forecasts, and these models' forecasts have not been accurate. Figure 5 contrasts the forecasts through 2025 with the actual trend line of GAST

data from the Hadley Centre and the Climactic Research Unit, University of East Anglia (CRU) for 2000-2012 (identified as “HadCRUT4 Trend/Forecast” on the chart). The actual Hadley Centre CRU trend line is “flat” at 0.4646 °C; it is portrayed as a flat line from 2000 through 2012 because its regression line slope is not statistically significant.

The GAST data up to 2008 (which also had a flat trend line) was, of course, available to EPA, and in fact both EPA and IPCC heavily relied on the Hadley Centre CRU’s temperature data, analysis, and forecasts. EPA, Climate Change, Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, at pp. 28-29 (Dec. 7, 2009), *available at* <http://www.epa.gov/climatechange/endangerment/index.html#tsd>. Notably, the Hadley Centre recently announced a forecast that this trend line will remain flat for another five years. Met Office, Research, *available at* <http://www.metoffice.gov.uk/research/climate/seasonal-to-decadal/long-range/decadal-fc> (last visited May 17, 2013) (“Global average temperature is expected to remain between 0.28 °C and 0.59 °C (90% confidence range) above the long-term (1971-2000) average during the period 2013-2017, with values most likely to be about 0.43 °C higher than average”). Thus, in Figure 5, the Trend/Forecast trend line is shown as flat through 2017.

Critically, the Hadley Centre CRU GAST Trend/Forecast line lies below even the Commit-Stop CO₂ scenario, in which worldwide CO₂ emissions are assumed to be held to 1992 levels. Since 1970, atmospheric CO₂ concentrations are up 21 percent. Mona Loa CO₂ Annual Mean Growth Rates, Earth System Research Laboratory, Global Monitoring Division, *available at* ftp://ftp.cmdl.noaa.gov/ccg/co2/trends/co2_annmean_mlo.txt (last visited May 17, 2013).

As Figure 5 plainly demonstrates, the models EPA relied on as its third line of evidence are invalid. That is not surprising because EPA never carried out any published forecast reliability tests. And, as discussed above, EPA's assumed Greenhouse Gas Fingerprint Theory simply does not comport with the real world. Thus, models based on that theory should never have been expected to be valuable for policy analysis involving an Endangerment Finding that so critically affects American energy, economic, and national security.

Amici believe that no scientists have devised an *empirically validated* theory proving that higher atmospheric CO₂ levels will lead to higher GAST. Moreover, if the causal link between higher atmospheric CO₂ concentrations and higher GAST is broken by invalidating each of EPA's three lines of evidence, then EPA's assertions that

higher CO₂ concentrations also cause sea-level increases and more frequent and severe storms, floods, and droughts are also disproved. Such causality assertions require a *validated* theory that higher atmospheric CO₂ concentrations cause increases in GAST.² Lacking such a validated theory, EPA's conclusions cannot stand. In science, credible empirical data always trumps proposed theories, even if those theories are claimed to (or actually do) represent the current consensus.

II. SERIOUS DEFICIENCIES IN EPA'S PROCESS CONTRIBUTED TO ITS SCIENTIFIC ERRORS.

That EPA's conclusions were so wrong is not too surprising given deficiencies in the process it followed to reach them. Amici wish to highlight some of those deficiencies.

On October 7, 2009, before EPA issued its Endangerment Finding, a group of independent scientists, including some of amici, submitted a letter to EPA. In that letter, the scientists urged EPA to consider (1) whether the earth's climate is changing in an unusual or anomalous fashion; (2) whether the science permits rejection of the

² Indeed, empirical data also shows that the claim that there have been such phenomena is itself invalid. Brief of Amici Curiae Scientists in Support of Petitioners Supporting Reversal, at 22-26, *Coalition for Responsible Regulation, Inc. v. Environmental Protection Agency*, No. 09-1322 (CADDC June 8, 2011), ECF No. 1312291.

hypothesis that CO₂ only has a minor effect on the earth's climate; (3) whether climate models that assume CO₂ is a key determinant of climate change can provide accurate forecasts of future conditions; and (4) whether natural (non-anthropogenic) forces and internal climate variability are the primary drivers of the earth's climate. Comment submitted by Dr. David R. Legates, C.C.M., Assoc. Professor of Climatology, Univ. of Del., to Hon. Lisa P. Jackson, Adm'r, EPA (Oct. 7, 2009), docketed as EPA-HQ-OAR-2009-11465 (Oct. 21, 2009), *available at* <http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2009-0171-11465> (hereinafter "Comment by Legates"); see 74 Fed. Reg. 18886 (2009). Essentially, EPA was expressly urged to consider the facts discussed above. The scientists also urged EPA to use the Scientific Advisory Board process, permitting an on-the-record hearing, in which it could draw on analysis from qualified scientists in different fields of knowledge. See Comment submitted by Legates. But EPA ignored these comments, glossed over these fundamental scientific questions, and relied on adjusted, unreliable data.

EPA's own Inspector General, in a procedural review issued in September 2011, faulted EPA for procedural deficiencies including the refusal to use the Scientific Advisory Board process. EPA, Office of Inspector General, Procedural Review of EPA's Greenhouse Gases Endangerment Finding

Data Quality Processes, Report No. 11-P-0702, at 36 (Sept. 26, 2011), *available at* www.epa.gov/oig/reports/2011/20110926-11-P-0702.pdf (hereinafter “Inspector General’s Report”); Non-State Petitioners’ Request for Judicial Notice, *Coalition for Responsible Regulation, Inc. v. Environmental Protection Agency*, Case No. 09-1322 (CADC Sept. 30, 2011), ECF No. 1332845. In particular, the Inspector General criticized EPA for failing to follow all recommended steps for an external peer review by independent experts. See Inspector General’s Report, at 36.

Some of the signatories to the October 2009 letter and other independent scientists, in a group that also included some of the amici before this Court, lodged an amicus brief with the court of appeals making similar points about the data and EPA’s scientific conclusions. Brief of Amici Curiae Scientists in Support of Petitioners Supporting Reversal, *Coalition for Responsible Regulation, Inc. v. Environmental Protection Agency*, No 09-1322 (CADC June 8, 2011), ECF No. 1312291. The D.C. Circuit declined to grant leave for that brief to be filed. That court also denied parties’ request to supplement the record with the Inspector General’s report. Order, *Coalition for Responsible Regulations, Inc. v. Environmental Protection Agency*, No. 09-1322 (CADC Jan. 13, 2012), ECF No. 1352684.

In short, EPA's process was far less rigorous than it should and could have been. And the court of appeals erred in failing to recognize the deficiencies in it.

CONCLUSION

For these reasons, and those discussed more fully in the petitions, amici urge the Court to grant the petitions for a writ of certiorari.

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