Observed Climate Change and the Negligible Global Effect of Greenhouse-gas Emission Limits in the State of Arizona

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Summary for Policy Makers

In February 2005, Arizona Governor Janet Napolitano, citing concerns of global climate change caused by greenhouse gas emissions from human activities, issued an Executive Order creating the Arizona Climate Change Advisory Group (CCAG). The CCAG was tasked with:

• establishing a baseline inventory and forecast of greenhouse gas emissions in Arizona, and,

• producing a Climate Action Plan with recommendations for reducing the state's greenhouse gas emissions.

The Action Plan developed by the CCAG was accepted by Governor Napolitano and in September 2006 another Executive Order was signed which established a statewide goal of reducing Arizona's future greenhouse gas emissions to the 2000 emissions level by the year 2020, and to 50 percent below the 2000 level by 2040. A Climate Change Executive Committee was created to oversee implementation of the recommendations of the Climate Action Plan.

Remarkably, despite the words "climate" and "climate change" being prominently touted by all involved, there *is not one instance of any analysis being made as to what the direct consequences of achieving the Climate Action Plan's emissions reduction goals will have on state or global climate!* In page after page, the Climate Action Plan prominently touts the projected impacts of each of its many recommendations on reducing greenhouse gas *emissions* from Arizona, but nowhere does it translate the projected emissions reductions to any projected mitigation of *climate change*. Without a quantification of the climate impacts, the value of the Action Plan in achieving its (presumably) primary goal of protecting Arizonans from "climate change" cannot be assessed.

There is not one instance of any analysis being made as to what the direct consequences of achieving the Climate Action Plan's emissions reduction goals will have on state or global climate!

How could such a glaring oversight have occurred? Simple. The Governor's Arizona Climate Change Advisory Group has a dirty little secret it doesn't want you to know about—*the Action Plan will have absolutely no meaningful impact on the future course of global (much less statewide) climate change.*

In this report we do what the Advisory Group should have done. In fact, we do the Action Team one better. We analyze what the impacts on future climate change will be if

Arizona ceased *all* of its greenhouse gas emissions, now and forever. What we find is eye-opening. Even a complete cessation of greenhouse emissions from Arizona will likely slow the future rate of global warming by less than three *thousandths* (<0.003) of a ºC per century. The estimated impact on sea level will be an equally meager five *hundredths* of a centimeter. These changes are scientifically and realistically meaningless.

Worse still, is that greenhouse gas emissions are increasing so rapidly in China that her new emissions will completely subsume the entirely of Arizona's emissions "savings" in less than two month's time! Clearly, the CCAG's Plan of merely calling for incremental *reductions* in greenhouse gas emissions will fare even poorer. There is simply no *climatic* gain to be had from emissions reductions in Arizona. The CCAG must know this, but apparently doesn't want voters to.

A purposeful deception with such enormous consequences would be malfeasance of office.

Additionally, we review Arizona's long-term climate history and find little in the way of evidence that greenhouse gas build-up in the atmosphere has altered Arizona's climate. Instead of long-term changes, short-term variability dominates the state's average temperature, precipitation, and drought frequency.

Current temperatures are similar to ones observed at the end of the 19th century—more than 100 years ago. A review of more than 2,000 years of the state's moisture history reveals that until very recently the state's natural climate was characterized by much drier conditions. Additional research shows that the state's moisture conditions can be tied directly to oscillations in patterns of sea surface temperatures in the Atlantic and Pacific Oceans—oscillations which are part of the earth's natural cycles.

Cycles of wildfire can also be traced back to these same ocean patterns. Further, scares of increasing tropical diseases and a rising sensitivity to excessive heat are easily shown to be without foundation.

All told, Arizonans have been little impacted by global "climate change." Regulations prescribing a reduction in the state's greenhouse gas emissions, such as those recommended by the ill-named Climate Action Plan, will have no detectable effect on future climate change. Unfortunately, the same can't be said about the impact of emissions regulations on the state's economy, which impacts have been projected as large and negative. As such, the Action Plan presents a perfect recipe for all-pain-no-gain outcomes for Arizona's citizenry.

Observed climate change in Arizona

Annual temperature: The historical time series of statewide annual temperatures in Arizona begins in 1895. The past 113 years have been marked by decadal scale variability rather than a strong overall trend. Temperatures during first decade of the 21st century are similar to those observed during the last decade of the 19th century. The intervening 100 years was marked by periods of warming and cooling. A strong cooling occurred from the 1900s to the 1910s, a warm-up took place from the 1920s to the 1940s, cooling again ensued from the 1950s through the 1970s, followed by warming again to the present. The highest annual average statewide temperature was observed in 1896 and three of the state's hottest 5 years (out of the past 113) occurred more than 100 years ago.

Arizona annual temperatures, 1895-2007

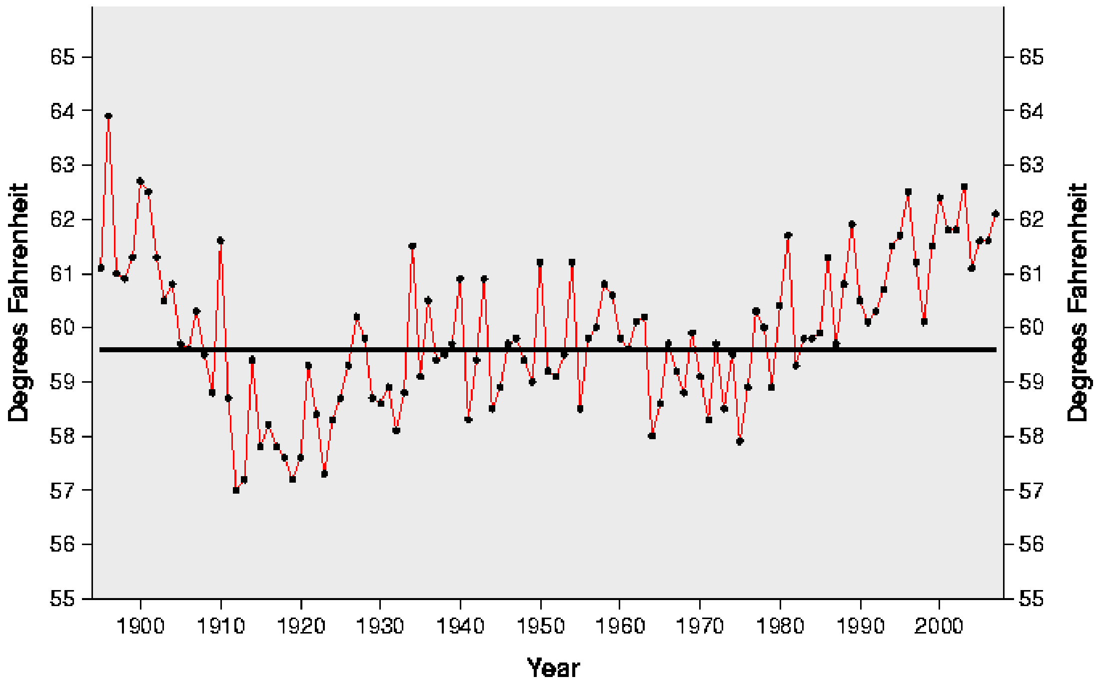

Figure 1. *Annual statewide average temperature history for Arizona, 1895-2007 (available from the National Climatic Data Center, http://www.ncdc.noaa.gov/oa/climate/research/cag3/az.html).*

Seasonal temperatures: When Arizona's temperatures are broken down into individual seasons the same general patterns persist throughout the year—the early decades of record were warm, the next several decades were cool, then temperatures rose through the 1930s, held relatively steady through the 1970s, and have been rising from the 1980s to the present. Current temperatures are similar to those experienced at the end of the 19th century in all four seasons. Clearly, annual and decadal-scale variability dominates the long-term temperature history of the state.

Arizona seasonal temperatures, 1895-2007

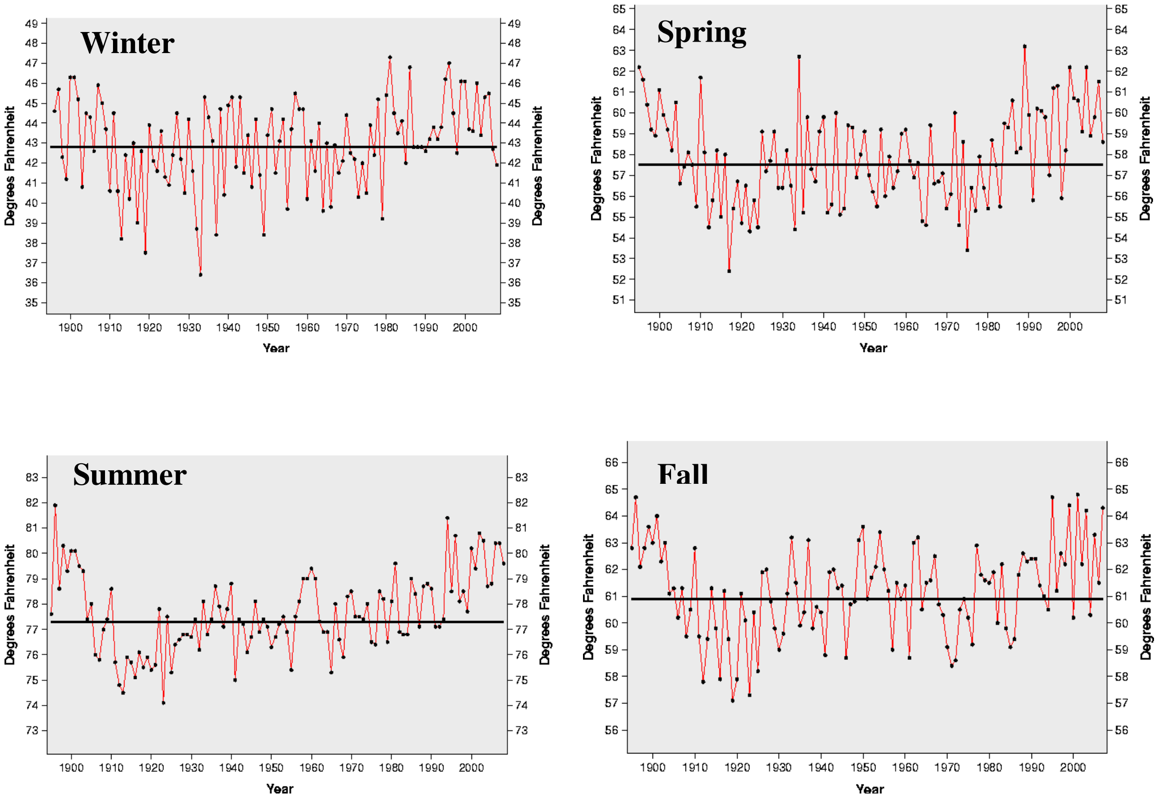

Figure 2. *Seasonal statewide average temperature history of Arizona (source: National Climatic Data Center, http://www.ncdc.noaa.gov/oa/climate/research/cag3/az.html).*

Precipitation: Averaged across the state of Arizona for each of the past 113 years, statewide annual total precipitation exhibits little overall long-term change. Instead, as in the case with temperatures, annual-to-decadal-scale variations dominate the state's precipitation history—dry in the early part of the record, wetter from the 1910s through the 1930s, relatively dry during the 1940s through the 1970s, wet during the 1980s and dry again during the past 10 years or so. Arizona's annual precipitation has varied from as much as 24.22 inches falling in 1905 to a little as 6.17 inches in 1956.

Arizona annual precipitation, 1895-2007

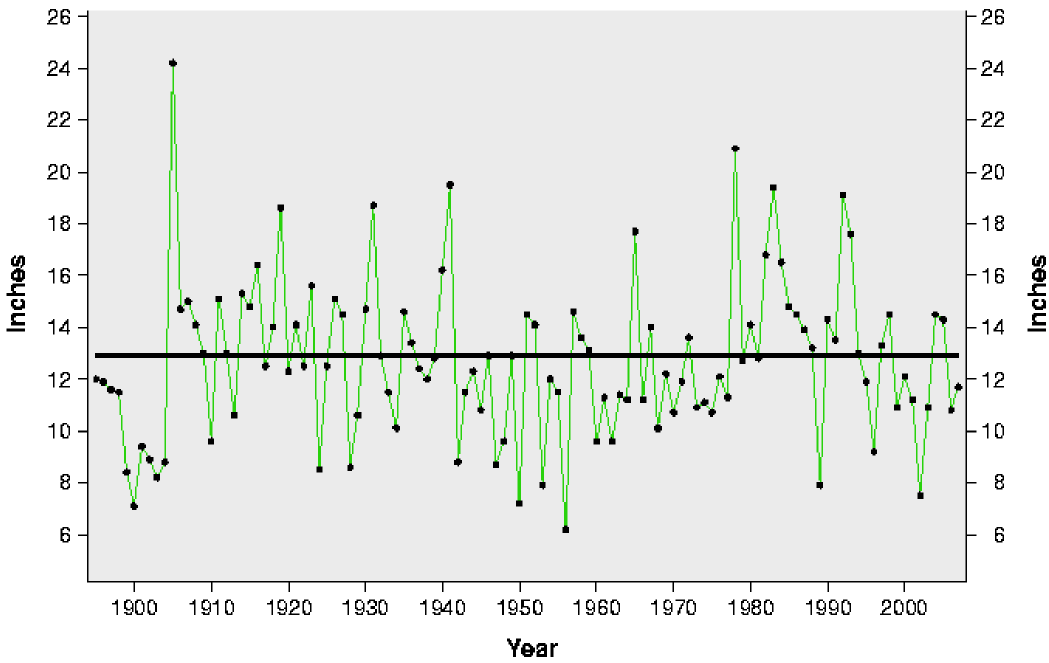

Figure 3. *Statewide average precipitation history of Arizona, 1895-2007 (source: National Climatic Data Center, http://www.ncdc.noaa.gov/oa/climate/research/cag3/az.html).*

Drought: Since 1895, there has been no long-term trend of drought in Arizona. Again, annual and decadal variability prevail.

Arizona drought severity, 1895-2007

Palmer drought severity index

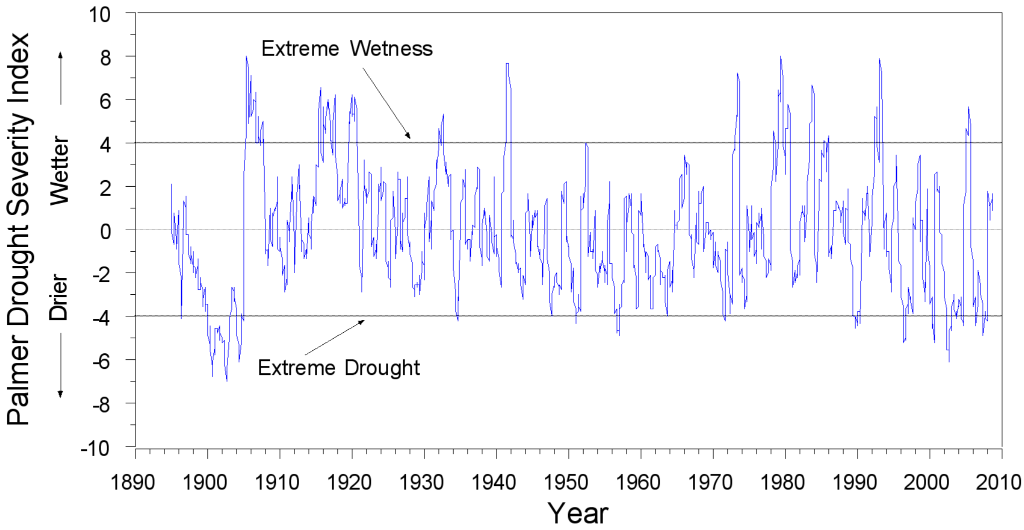

Figure 4. *Monthly statewide average values of the Palmer Drought Severity Index (PDSI) for the state of Arizona, 1895-2007 (data from the National Climate Data Center, www.ncdc.noaa.gov)*

Monthly mean Palmer Drought Severity Index values—a standard measure of moisture conditions that reconciles inputs from precipitation and losses from evaporation—show no trend during the past 113 years. The period of record is dominated by short-term variations that clearly illustrate that both dry periods and wet periods are not uncommon in the climate of Arizona.

Paleodrought: The droughts experienced during the past 113 years (including the one of the past few years) in Arizona pale in comparison to the megadroughts that have occurred there in the past. The character of past climates can be judged from analysis of climate-sensitive proxies such as tree-rings. Using precipitation information about past precipitation contained in tree rings, Dr. Edward Cook and colleagues have been able to reconstruct a summertime PDSI record for Arizona that extends back in time more than 2000 years.

Interestingly, the trend over the past two millennia has been towards generally *wetter* conditions. In fact, one of the wettest periods during the past 2,000 years in Arizona, and across the American West at large, was the wet period that occurred during the early 20th century.

But rather than anomalously wet periods, the most remarkable characteristic of the reconstructed drought history of Arizona is the prolonged dry periods and "megadroughts" that occurred many times in past centuries—droughts that dwarfed any conditions experienced in recent memory. In fact, most of the past 2,000 years is characterized by conditions that are far drier than the average conditions of the 20th century. Another characteristic of Arizona's past climate are the large swings from conditions that approached the 20th century in terms of wetness to dry conditions that were far more intense and a far greater duration than any that have been experienced since the state was settled.

The paleo-climate record give us clear indication that droughts are a natural part of the Arizona's climate system and thus should not be used as an example of events that are caused by any type of anthropogenic climate change. Instead, they have been far worse in the past, long before any possible human influences.

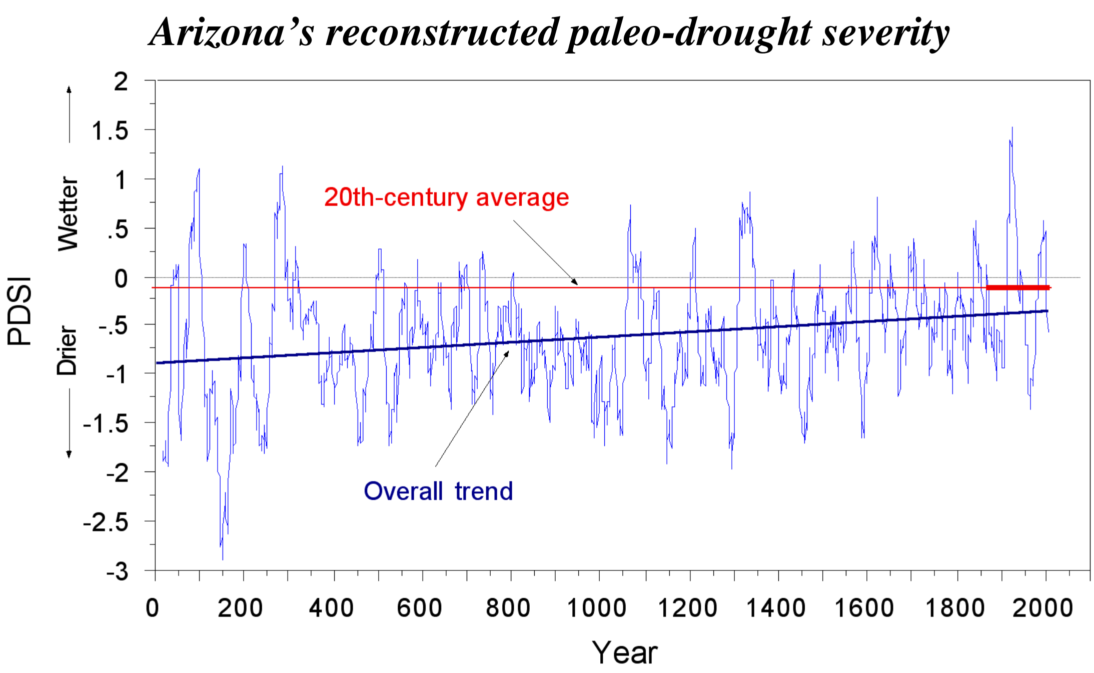

Figure 5. *The reconstructed summer (June, July, August) Palmer Drought Severity Index (PDSI) for Arizona from 0 A.D. to 2006 A.D. depicted as a 20-yr running mean. (National Climate Data Center, http://www.ncdc.noaa.gov/paleo/pdsi.html)*

Wildfires: There is a clear link between dry conditions and the outbreak of wildfires across the western United States, including the state of Arizona. Figure 6 shows the co-occurrence of regional wildfire and dry conditions in the U.S. Northern Rockies for the past several hundred years. Notice that most regional wildfire (red triangles) occur when conditions are dry (PDSI is below zero, or summer precipitation is less than normal). Most widespread wildfire outbreaks occur during times of low moisture levels.

Co-occurrence of droughts and wildfires in the Rocky Mountains

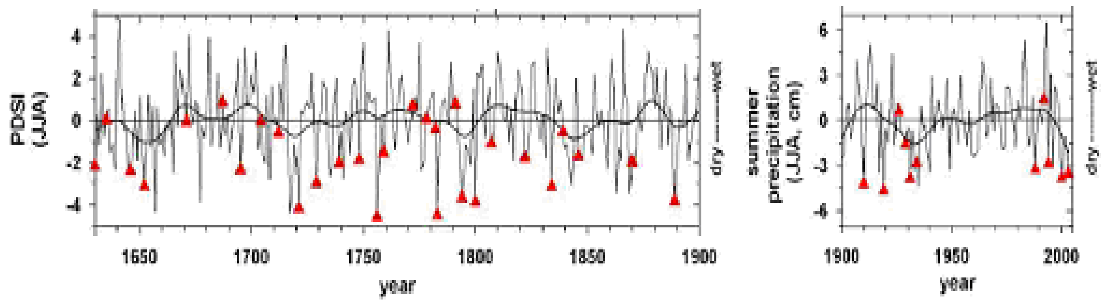

Figure 6. *Reconstructed summer Palmer Drought Severity Index during historical years (left) and regional summer precipitation during modern years (right) overlaid with the occurrence of regional wildfires (red triangles) in the Northern Rocky Mountains. (Source Heyerdahl et al.)*

As we have seen from our review of the paleodrought history of Arizona (Figure 5), periods of low moisture levels are not uncommon and have been occurring for more than 2000 years.

A recent study created a paleo-reconstruction of wildfires across the western U.S. during the past 550 years using data collected on fire scars on trees (Kitzberger et al., 2007). In addition to finding the expected close occurrence between wildfires and droughts, the authors also found linkages between cycles of wildfire frequency and natural cycles of regional climate variability, both over the Pacific as well as the Atlantic Ocean. These natural cycles can go along way to explaining much of the variability in wildfire outbreaks.

Throughout history, wildfire and drought have been linked together in Arizona and the western United States. And wildfires and drought are both influenced by natural oscillations in patterns of sea surface temperature and atmospheric circulation systems in the Atlantic and Pacific oceans. There have been times in the past that have been extensively drier have been associated with a greater frequency of wildfires than anything that we have experienced in the past 100 years, prior to any widespread human impact on the composition of the atmosphere. This demonstrates that without any human alterations, the climate can change and vary in such a manner as to make both drought and wildfire a much more common occurrence in Arizona than it is today.

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Heat-related Mortality: Arizona has arguably the highest summer temperatures found in the United States and nevertheless has two thriving major metropolises in the midst of the heat—Phoenix and Tucson. If heat-related mortality is to become a major concern around the country in a warmer climate, then it ought to *already* be a major problem in southern Arizona where temperature are far hotter than they are ever projected to be in the rest of the country. But an examination of mortality statistics shows that incidences of mortality associated with excessive heat are rare in southern Arizona and for the most part statistically undetectable. This is strong evidence that large populations can adapt to the prevailing climate conditions, rather than simply perishing at their hand.

In fact, a number of weather/mortality research studies clearly demonstrate that during the several decades, the population in major U.S. cities all across the country has grown better adapted, and thus less sensitive, to the effects of excessive heat events (Davis et al., 2003a, 2003b). Each of the bars in the Figure 7 represents the annual number of heat-related deaths in 28 major cities across the United States. There should be three bars for each city, representing, from left to right, the decades of the 1970s, 1980s and 1990. For nearly all cities, the number of heat-related deaths (on a per capita basis) is declining (the bars are get smaller). This adaptation is most likely a result of improvements in medical technology, access to air-conditioned homes, cars, and offices, increased public awareness of potentially dangerous weather situations, and proactive responses of municipalities during extreme weather events.

Heat-related mortality trends across the U.S.

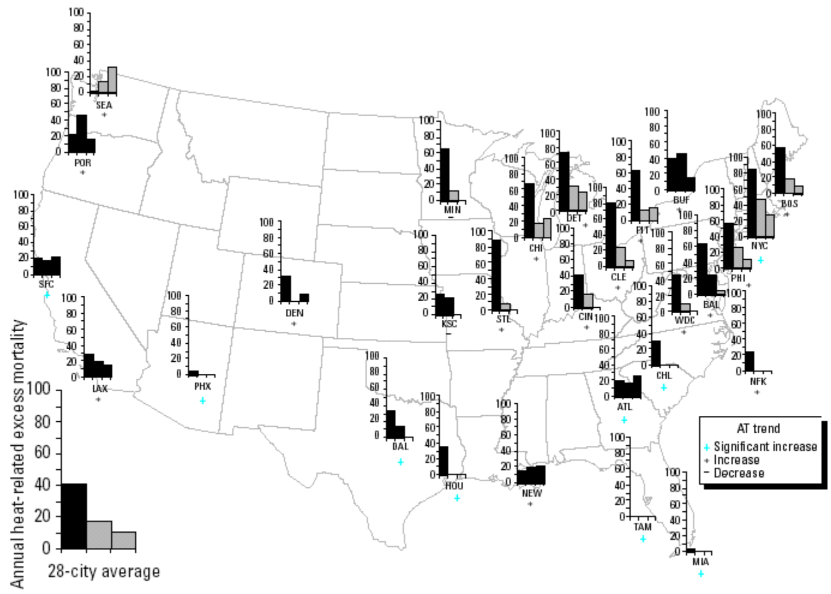


Figure 7. *Annual heat-related mortality rates (excess deaths per standard million populations). Each histogram bar indicates a different decade (from left to right, 1970s, 1980s, and 1990s). (Source: Davis et al., 2003b).*

The pattern of the distribution of heat-related mortality shows that in locations where extremely high temperatures are more commonplace, such as along the southern tier states, the prevalence of heat-related mortality is much lower than in the regions of the country where extremely high temperatures are somewhat rarer (e.g. the northeastern U.S.). This is especially true for Phoenix, the Arizona city that was part of the study. In Phoenix, no significant relationship was found between daily mortality and daily temperatures during the summertime (with the exception of a very small relationship in during the 1960s). This provides strong demonstration that populations adapt to their prevailing climate conditions—as undoubtedly is the case for Arizonans. Contrary to pessimistic projections of increasing heat-related mortality, if temperatures warm in the future and excessive heat events become more common, there is every reason to expect that adaptations will take place to lessen their impact on the general population.

Vector-borne Diseases: "Tropical" diseases such as malaria and dengue fever have been erroneously predicted to spread due to global warming. In fact, they are related less to climate than to living conditions. These diseases are best controlled by direct application of sound, known public health policies.

Malaria Distribution in the United States

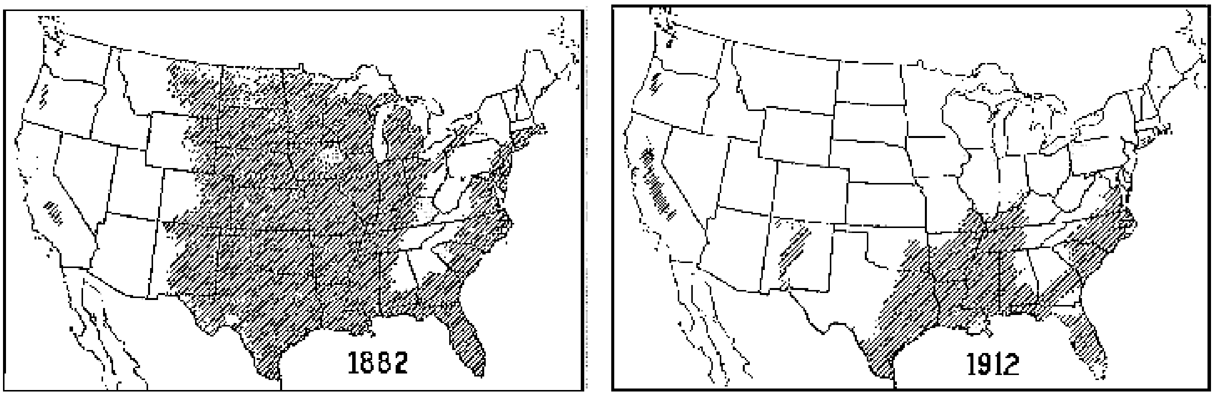


Figure 8. *Shaded regions indicate locations where malaria was endemic in the United States (source: Zucker et al., 1996).*

The two tropical diseases most commonly cited as spreading as a result of global warming, malaria and dengue fever, are not in fact "tropical" at all and thus are not as closely linked to climate as some ill-informed people suggest. For example, malaria epidemics occurred as far north as Archangel, Russia, in the 1920s, and in the Netherlands. Malaria was common in most of the United States prior to the 1950s (Reiter, 1996). In fact, in the late 1800s, a period when it was demonstrably colder in the United States than it is today, malaria was endemic in most of the United States east of the

Rocky Mountains. In 1878, about 100,000 Americans were infected with malaria; about one-quarter of them died. By 1912, malaria was already being brought under control, yet persisted in the southeastern United States well into the 1940s. In fact, in 1946 the Congress created the Communicable Disease Center (the forerunner to the current U.S. Centers for Disease Control and Prevention) for the purpose of eradicating malaria from the regions of the U.S. where it continued to persist. By the mid-to-late 1950s, the Center had achieved its goal and malaria was effectively eradicated from the United States. This occurred not because of climate change, but because of technological and medical advances. Better anti-malaria drugs, air-conditioning, the use of screen doors and windows, and the elimination of urban overpopulation brought about by the development of suburbs and automobile commuting were largely responsible for the decline in malaria (Reiter, 1996; Reiter, 2001). Today, the mosquitoes that spread malaria are still widely present in the Unites States, but the transmission cycle has been disrupted and the pathogen leading to the disease is absent. Climate change is not involved.

The effect of technology is also clear from statistics on dengue fever outbreaks, another mosquito-borne disease. In 1995, a dengue pandemic hit the Caribbean and Mexico. More than 2,000 cases were reported in the Mexican border town of Reynosa. But in the town of Hidalgo, Texas, located just across the river, there were only seven reported cases of the disease (Reiter, 1996).

Dengue Fever at the Texas/Mexico border from 1980 to 1999

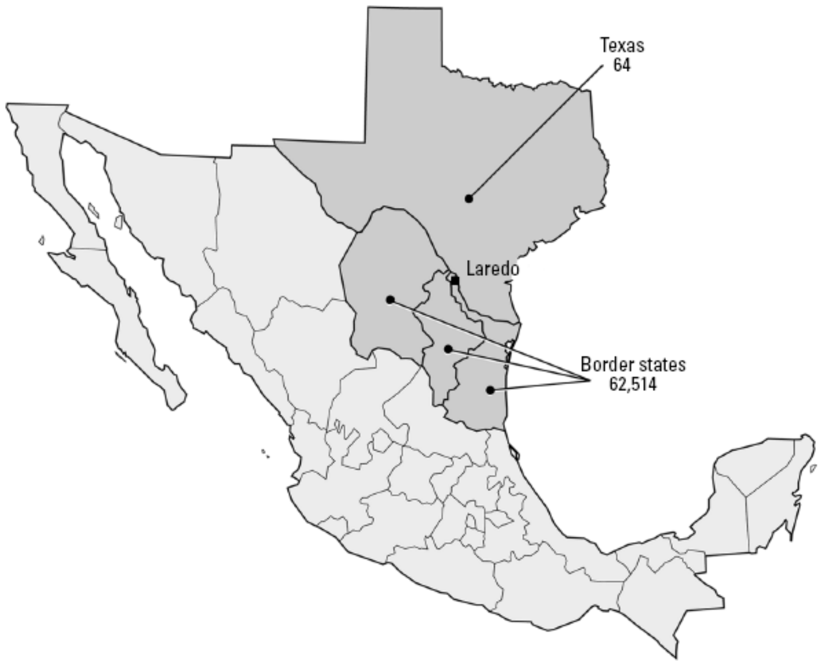


Figure 9. *Number of cases of Dengue Fever at the Texas/Mexico border from 1980 to 1999. During these 20 years, there were 64 cases reported in all of Texas, while there was nearly 1,000 times that amount in the bordering states of Mexico. (Source: Reiter, 2001).*

This is just not an isolated example, for data collected over the past several decades has shown a similarly large disparity between the high number of cases of the disease in northern Mexico and the rare occurrences in the southwestern United States (Reiter, 2001). There is virtually no difference in climate between these two locations, but a world of difference in infrastructure, wealth, and technology—city layout, population density, building structure, window screens, air-conditioning and personal behavior are all factors that play a large role in the transmission rates (Reiter, 2001).

Another "tropical" disease that is often (falsely) linked to climate change is the West Nile Virus. The claim is often made that a warming climate is allowing the mosquitoes that carry West Nile Virus to spread into Arizona. However, nothing could be further from the truth.

West Nile Virus was introduced to the United States through the port of New York City in the summer of 1999. Since its introduction, it has spread rapidly across the country, reaching the West Coast by 2002 and has now been documented in every state as well as most provinces of Canada. This is not a sign that the U.S. and Canada are progressively warming. Rather, it is a sign that the existing environment is naturally primed for the virus.

The vector for West Nile is mosquitoes; wherever there is a suitable host mosquito population, an outpost for West Nile virus can be established. And it is not just *one* mosquito species that is involved. Instead, the disease has been isolated in over *40 mosquito species* found throughout the United States. So the simplistic argument that climate change is allowing a West Nile carrying mosquito species to move into Arizona is simply wrong. The already-resident mosquito populations of Arizona are appropriate hosts for the West Nile virus—as they are in every other state.

Clearly, as is evident from the establishment of West Nile virus in every state in the contiguous U.S., climate has little, or nothing, to do with its spread.

Clearly, as is evident from the establishment of West Nile virus in every state in the contiguous U.S., climate has little, or nothing, to do with its spread. The annual average temperature from the southern part of the United States to the northern part spans a range of more than 40ºF, so clearly the virus exists in vastly different climates. In fact, West Nile virus was introduced in New York City—hardly the warmest portion of the country—and has spread westward and southward into both warmer and colder and wetter and drier climates. This didn't happen because climate changes allowed its spread, but because the virus was introduced to a place that was ripe for its existence—basically any location with a resident mosquito population (which describes basically anywhere in the U.S).

Spread of the West Nile Virus across the United States after its Introduction in New York City in 1999

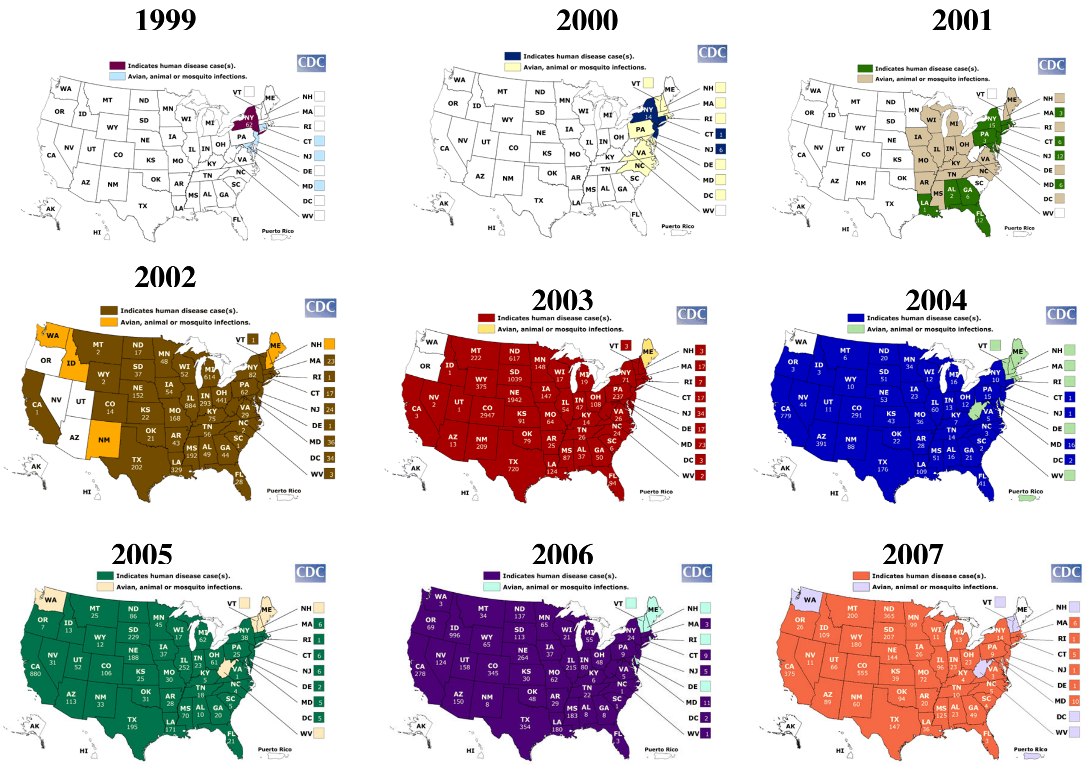


Figure 10. *Spread of the occurrence of the West Nile Virus from its introduction to the United States in 1999 through 2007. By 2003, virtually every state in the country had reported the presence of virus. (source: http://www.cdc.gov/ncidod/dvbid/westnile/Mapsactivity/surv&control07Maps.htm).*

West Nile virus now exists in Arizona because the extant climate/ecology of Arizona is one in which the virus can thrive. The reason that it was not found in Arizona in the past was simply because it had not been introduced. Climate change in Arizona has absolutely nothing to do with it. By following the virus' progression from 1999 through 2007, one clearly sees that the virus spread from NYC southward and westward, it did not invade slowly from the (warmer) south, as one would have expected if warmer temperatures was the driver.

Since the disease spreads in a wide range of both temperature and climatic regimes, one could raise or lower the average annual temperature in Arizona by many degrees or vastly change the precipitation regime and not make a bit of difference in the aggression of the West Nile Virus. Science-challenged claims to the contrary are not only ignorant but also dangerous, serving to distract from real epidemiological diagnosis which allows health officials critical information for protecting the citizens of Arizona.

Impacts of climate-mitigation measures in Arizona

Globally, in 2005, humankind emitted 28,193 million metric tons of carbon dioxide ($mmtCO_2$: EIA, 2007a), of which emissions from Arizona accounted for 97.7 $mmtCO_2$, or only 0.36% (EIA, 2007b). The proportion of manmade CO_2 emissions from Arizona will decrease over the 21st century as the rapid demand for power in developing countries such as China and India outpaces the growth of Arizona's CO_2 emissions (EIA, 2007b).

During the past 5 years, global emissions of CO_2 from human activity have increased at an average rate of 3.5%/yr (EIA, 2007a), meaning that the annual *increase* of anthropogenic global CO_2 emissions is about 10 times greater than Arizona 's *total* emissions. Even a complete cessation of *all* CO_2 emissions in Arizona will be undetectable globally. *A fortiori,* regulations prescribing an *incremental reduction*, rather than a complete cessation, of Arizona's CO_2 emissions will have no effect on global climate.

Wigley (1998) examined the climate impact of adherence to the emissions controls agreed under the Kyoto Protocol by participating nations, and found that, if all developed countries meet their commitments in 2010 and maintain them through 2100, with a mid-range sensitivity of surface temperature to changes in CO_2, the amount of warming "saved" by the Kyoto Protocol would be 0.07°C by 2050 and 0.15°C by 2100. The global sea level rise "saved" would be 2.6 cm, or one inch. A complete cessation of CO_2 emissions in Arizona is only a tiny fraction of the worldwide reductions assumed in Dr. Wigley's global analysis, so its impact on future trends in global temperature and sea level will be only a minuscule fraction of the negligible effects calculated by Dr. Wigley.

We now apply Dr. Wigley's results to CO_2 emissions in Arizona, assuming that the ratio of U.S. CO_2 emissions to those of the developed countries which have agreed to limits under the Kyoto Protocol remains constant at 39% (25% of global emissions) throughout the 21st century. We also assume that developing countries such as China and India continue to emit at an increasing rate. Consequently, the annual proportion of global CO_2 emissions from human activity that is contributed by human activity in the United States will decline. Finally, we assume that the *proportion* of total U.S. CO_2 emissions in Arizona – now 1.6% – remains constant throughout the 21st century. With these assumptions, we generate the following table derived from Wigley's (1998) mid-range emissions scenario (which itself is based upon the IPCC's scenario "IS92a"):

Table 1

Projected annual CO_2 emissions (mmtCO$_2$)

Year	Global emissions: *Wigley, 1998*	Developed countries: *Wigley, 1998*	U.S. (39% of developed countries)	Arizona (1.6% of U.S.)
2000	26,609	14,934	5,795	93
2025	41,276	18,308	7,103	114
2050	50,809	18,308	7,103	114
2100	75,376	21,534	8,355	134

***Note:** Developed countries' emissions, according to Wigley's assumptions, do not change between 2025 and 2050: neither does total U.S or Arizona emissions.*

In Table 2, we compare the total CO_2 emissions saving that would result if Arizona's CO_2 emissions were completely halted by 2025 with the emissions savings assumed by Wigley (1998) if all nations met their Kyoto commitments by 2010, and then held their emissions constant throughout the rest of the century. This scenario is "Kyoto Const."

Table 2

Projected annual CO_2 emissions savings (mmtCO$_2$)

Year	Arizona	Kyoto Const.
2000	0	0
2025	114	4,697
2050	114	4,697
2100	134	7,924

Table 3 shows the proportion of the total emissions reductions in Wigley's (1998) case that would be contributed by a complete halt of all Arizona's CO_2 emissions (calculated as column 2 in Table 2 divided by column 3 in Table 2).

Table 3

Arizona' percentage of emissions savings

Year	Arizona
2000	0.0%
2025	2.4%
2050	2.4%
2100	1.7%

Using the percentages in Table 3, and assuming that temperature change scales in proportion to CO_2 emissions, we calculate the global temperature savings that will result from the complete cessation of anthropogenic CO_2 emissions in Arizona:

Table 4

Projected global temperature savings (°C)

Year	Kyoto Const	Arizona
2000	0	0
2025	0.03	0.0007
2050	0.07	0.002
2100	0.15	0.003

Accordingly, a cessation of all of Arizona's CO_2 emissions would result in a climatically-irrelevant global temperature reduction by the year 2100 of about three *thousandths* of a degree Celsius. Results for sea-level rise are also negligible:

Table 5

Projected global sea-level rise savings (cm)

Year	Kyoto Const	Arizona
2000	0	0
2025	0.2	0.005
2050	0.9	0.02
2100	2.6	0.05

A complete cessation of all anthropogenic emissions from Arizona will result in a global sea-level rise savings by the year 2100 of an estimated 0.05 cm, or two *hundredths* of an inch. Again, this value is climatically irrelevant.

Even if the entire Western world were to close down its economies completely and revert to the Stone Age, without even the ability to light fires, the *growth* in emissions from China and India would replace our *entire* emissions in little more than a decade. In this context, any cuts in emissions from Arizona would be extravagantly pointless, and could reasonably b construed as *malfeasance* of office.

A cessation of all of Arizona's CO_2 emissions would result in a climatically-irrelevant global temperature reduction by the year 2100 of about three thousandths of a degree Celsius; and would result in a global sea-level rise "savings" by the year 2100 of an estimated 0.05 cm, or two hundredths of an inch. These values are also climatically irrelevant.

Costs of Federal Legislation

What would be the potential costs to Arizona of legislative actions designed to cap greenhouse gas emissions? An analysis was recently completed by the Science Applications International Corporation (SAIC), under contract from the American Council for Capital Formation and the National

Association of Manufacturers (ACCF and NAM), using the National Energy Modeling System (NEMS); the same model employed by the US Energy Information Agency to examine the economic impacts.

For a complete description of these and other related findings please visit: http://www.instituteforenergyresearch.org/cost-of-climate-change-policies/
To summarize, SAIC found that by the year 2020, average annual household income in Arizona would decline by $822 to $2665 and by the year 2030 the decline would increase to between $3382 and $6167. The state would stand to lose between 23,000 and 55,000 jobs by 2020 and between 64,000 and 85,000 jobs by 2030. At the same time gas prices could increase by over $5 a gallon by the year 2030 and the states' Gross Domestic Product could decline by then by as much as $11.3 billion/yr.

And all this economic hardship would come with absolutely no detectable impact on the course of future climate. This is the epitome of a scenario of all pain and no gain.

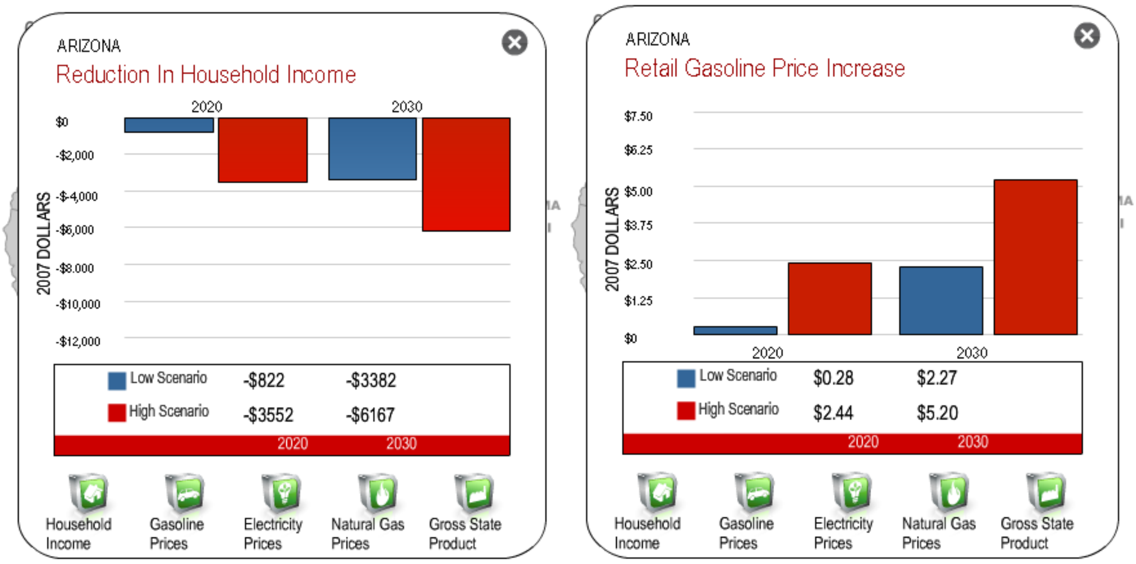


Figure 11. *The economic impacts in Arizona of federal legislation to limit greenhouse gas emissions green. (Source: Science Applications International Corporation, 2008, http://www.instituteforenergyresearch.org/cost-of-climate-change-policies/)*

Table 6

State CO_2 Mitigation Plans: Futility and Projected Climate "Savings"

State	2004 Emissions (million metric tons CO2)	Percentage of Global Total	Time until Total Emissions Cessation Subsumed by Foreign Growth (days)		Temperature "Savings" (°C)		Sea Level "Savings" (cm)	
			Global Growth	China Growth	2050	2100	2050	2100
AK	47.0	0.17	18	28	0.0008	0.0013	0.0108	0.0217
AL	140.3	0.52	53	84	0.0025	0.0037	0.0321	0.0647
AR	63.7	0.23	24	38	0.0011	0.0017	0.0146	0.0294
AZ	96.9	0.36	37	58	0.0017	0.0026	0.0222	0.0447
CA	398.9	1.47	152	239	0.0071	0.0106	0.0914	0.1840
CO	93.1	0.34	35	56	0.0017	0.0025	0.0213	0.0430
CT	45.5	0.17	17	27	0.0008	0.0012	0.0104	0.0210
DC	4.0	0.01	2	2	0.0001	0.0001	0.0009	0.0018
DE	16.9	0.06	6	10	0.0003	0.0004	0.0039	0.0078
FL	258.0	0.95	98	155	0.0046	0.0069	0.0591	0.1190
GA	175.7	0.65	67	105	0.0031	0.0047	0.0402	0.0810
HI	22.7	0.08	9	14	0.0004	0.0006	0.0052	0.0105
IA	81.8	0.30	31	49	0.0015	0.0022	0.0187	0.0377
ID	15.6	0.06	6	9	0.0003	0.0004	0.0036	0.0072
IL	244.5	0.90	93	146	0.0044	0.0065	0.0560	0.1128
IN	239.9	0.88	91	144	0.0043	0.0064	0.0549	0.1107
KS	77.8	0.29	30	47	0.0014	0.0021	0.0178	0.0359
KY	151.5	0.56	58	91	0.0027	0.0040	0.0347	0.0699
LA	180.5	0.66	69	108	0.0032	0.0048	0.0413	0.0833
MA	83.6	0.31	32	50	0.0015	0.0022	0.0192	0.0386
MD	80.6	0.30	31	48	0.0014	0.0021	0.0185	0.0372
ME	23.3	0.09	9	14	0.0004	0.0006	0.0053	0.0107
MI	189.9	0.70	72	114	0.0034	0.0051	0.0435	0.0876
MN	102.8	0.38	39	62	0.0018	0.0027	0.0235	0.0474
MO	139.8	0.51	53	84	0.0025	0.0037	0.0320	0.0645
MS	65.1	0.24	25	39	0.0012	0.0017	0.0149	0.0300
MT	35.1	0.13	13	21	0.0006	0.0009	0.0080	0.0162
NC	152.3	0.56	58	91	0.0027	0.0041	0.0349	0.0703
ND	49.9	0.18	19	30	0.0009	0.0013	0.0114	0.0230
NE	43.6	0.16	17	26	0.0008	0.0012	0.0100	0.0201
NH	22.0	0.08	8	13	0.0004	0.0006	0.0050	0.0101
NJ	128.6	0.47	49	77	0.0023	0.0034	0.0295	0.0594
NM	59.0	0.22	22	35	0.0011	0.0016	0.0135	0.0272
NV	47.9	0.18	18	29	0.0009	0.0013	0.0110	0.0221
NY	216.7	0.80	82	130	0.0039	0.0058	0.0496	0.1000
OH	263.6	0.97	100	158	0.0047	0.0070	0.0604	0.1216
OK	100.4	0.37	38	60	0.0018	0.0027	0.0230	0.0463
OR	42.5	0.16	16	25	0.0008	0.0011	0.0097	0.0196
PA	282.5	1.04	107	169	0.0050	0.0075	0.0647	0.1304
RI	11.0	0.04	4	7	0.0002	0.0003	0.0025	0.0051
SC	87.5	0.32	33	52	0.0016	0.0023	0.0200	0.0404
SD	14.0	0.05	5	8	0.0002	0.0004	0.0032	0.0064
TN	123.6	0.45	47	74	0.0022	0.0033	0.0283	0.0570
TX	652.5	2.40	248	391	0.0116	0.0174	0.1495	0.3010
UT	65.7	0.24	25	39	0.0012	0.0017	0.0150	0.0303
VA	129.0	0.47	49	77	0.0023	0.0034	0.0295	0.0595
VT	7.0	0.03	3	4	0.0001	0.0002	0.0016	0.0032
WA	82.9	0.30	32	50	0.0015	0.0022	0.0190	0.0382
WI	108.8	0.40	41	65	0.0019	0.0029	0.0249	0.0502
WV	113.0	0.42	43	68	0.0020	0.0030	0.0259	0.0521
WY	63.9	0.24	24	38	0.0011	0.0017	0.0146	0.0295
U.S. Total	**5,942.2**	**21.86**	**2261**	**3558**				

Arizona Scientists Reject UN's Global Warming Claims[1]

At least 711 Arizona scientists agree in principle with our analysis, they having petitioned the Federal government that the UN's human-caused global warming hypothesis is "without scientific validity and that government action on the basis of this hypothesis would unnecessarily and counterproductively damage both human prosperity and the natural environment of the Earth."

They are joined by over **31,072** Americans with university degrees in science – including **9,021** PhDs.

The petition and entire list of US signers can be found here:
http://www.petitionproject.org/index.html

Names of the Arizona scientists who signed the petition can be viewed here:
http://petitionproject.org/gwdatabase/Signers_BY_State.html

Papers focusing on the Problems with the IPCC

http://scienceandpublicpolicy.org/originals/prejudiced_authors_prejudiced_findings.html

http://scienceandpublicpolicy.org/originals/whytheipccshouldbedisbanded.html

http://scienceandpublicpolicy.org/peerreview.html

http://scienceandpublicpolicy.org/reprint/sellers_ipcc_report.html

http://scienceandpublicpolicy.org/reprint/has_ipcc_inflated_feedback_factor.html

http://scienceandpublicpolicy.org/reprint/ipcc_on_the_run.html

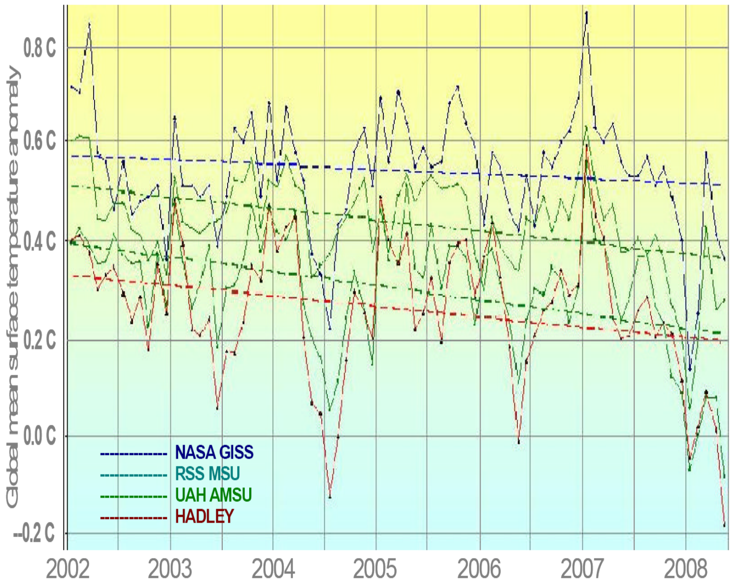
http://scienceandpublicpolicy.org/reprint/open_letter_to_un.html

http://scienceandpublicpolicy.org/reprint/whatiswrongwiththeipcc.html

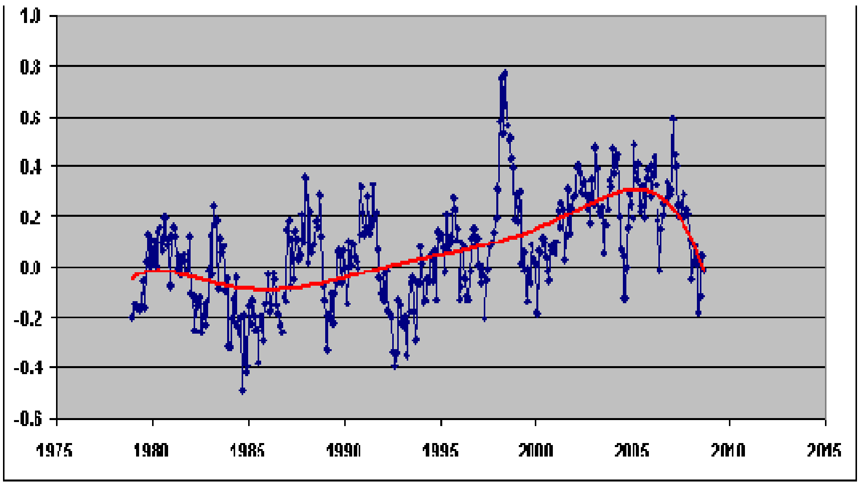
http://scienceandpublicpolicy.org/reprint/akasofu_cool_it.html

[1] Questions about this survey should be addressed to the petition organizers.

Appendix: **Recent *global* temperatures:** As the global temperature graph below shows, all four of the world's major global surface temperature datasets (NASA GISS; RSS; UAH; and Hadley/University of East Anglia) show a decline in temperatures that have now persisted for seven years. The fall in temperatures between January 2007 and January 2008 was the greatest January-January fall since records began in 1880.



All four of the world's major surface-temperature datasets show seven years of global cooling. The straight lines are the regression lines showing the trend over past seven years. It is decisively downward.



Lower-troposphere global surface temperature anomalies, 1979-2008 (UAH satellite data).

The year 2008 will turn out to have been no warmer than 1980 – 28 years ago. This is not a short-run change: the cooling trend set in as far back as late 2001, seven full years ago, and there has been no net warming since 1995 on any measure.

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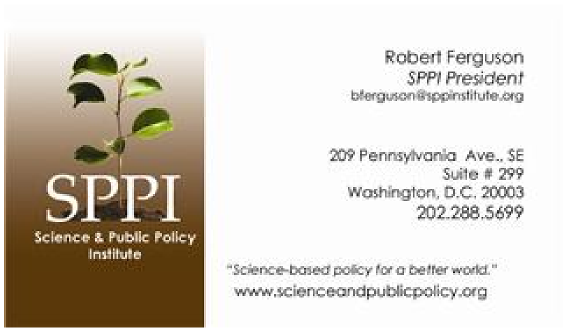
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