

## Answer Key: Homework Assignment #7

Energy Economics 399

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It is probably easiest to simply go through the article point-by point and examine Will's claims.

1. Will states, "Chu recently told the Los Angeles Times that global warming might melt 90 percent of California's snowpack, which stores much of the water needed for agriculture." What Chu actually said was, "In a worst case, up to 90 percent of the Sierra snowpack could disappear, all but eliminating the natural storage system that feeds the valleys at the heart of the state's \$35 billion farm industry." Thus, Chu is not saying what will happen but the worst that could happen. Furthermore, the original article goes on to note, "Gov. Arnold Schwarzenegger told California's farmers to prepare for a third straight year of drought due to low Sierra snow levels and some of the state's top farming counties may get little or no deliveries of water."  
(<http://www.reuters.com/article/environmentNews/idUSTRE5135OY20090205>)
2. Will talks at length about how, "In the 1970s, 'a major cooling of the planet' was 'widely considered inevitable...'" All of the sources he cites obviously make a case for global cooling, but global cooling was far from "widely considered inevitable." In fact, the very first paragraph of the first New York Times article Will cites states, "The world's climate is changing. Of that scientists are firmly convinced. But what direction and why are subjects of deepening debate." (New York Times, May 21, 1975, pg. 92) The article goes on to compare the theories of global cooling advocates and global warming advocates. "If worldwide energy consumption continues to increase at its present rates, catastrophic climate changes have been predicted by M. I Budyko, a leading Soviet specialist. This [warming] will lead to a complete destruction of the polar ice covers." This does not sound much like scientists were considering global cooling to be inevitable.

A review of climate studies from the 1970s ("The Myth of the 1970s Global Cooling Scientific Consensus" Thomas C. Peterson, William M. Connolley, and John Fleck, Bulletin of the American Meteorological Society, September 2008) found that "There was no scientific consensus in the 1970s that the Earth was headed into an imminent ice age. Indeed, the possibility of anthropogenic warming dominated the peer-reviewed literature even then." Their examination of peer-reviewed articles found, during the period from 1965 through 1979, 7 paper suggesting global cooling, 20 neutral papers, and 44 warming papers suggesting global warming. Since that time, the consensus has turned even more sharply towards supporting the theory of global warming with between 90-94% of studies included in the IPCC's 4<sup>th</sup> report suggesting global warming is occurring.

Two final points here. First, with thousands of studies being performed regarding climate change, even if 90-94% of these studies support the theory of global warming, a global warming denier can always cherry-pick literally hundreds of scientific articles that fail to find a trend of global warming. Of course, these studies are balanced out with thousands on the other side suggesting warming is happening. Second, even if the global consensus in the 1970s was that of global cooling (which it wasn't), such a consensus is irrelevant in the face of newly collected data. Similarly, just because the global consensus in the 1400s stated that the Earth was at the center of the universe doesn't mean that Copernicus (1473-1543) and Galileo (1564-1642) were wrong in rejecting the previous consensus.

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3. The famous bet between Paul Ehrlich and Julian Simon is true but is somewhat an artifact of the time periods chosen. Below are the nominal and real values of Chrome, Copper, Nickel, Tin, and Tungsten for the years 1970, 1980, 1990, and 2007, the latest year available via the U.S. Geological Survey (<http://minerals.usgs.gov/ds/2005/140/#data>).

Real	Chrome	Copper	Nickel	Tin	Tungsten
1970	538	5,375	11,900	16,100	23,700
1980	1,260	4,419	12,300	36,900	36,600
1990	1,110	3,383	11,100	10,600	10,600
2007	1,620	5,685	29,200	15,600	28,200

Nominal	Chrome	Copper	Nickel	Tin	Tungsten
1970	128	1,280	2,840	3,840	5,640
1980	638	2,234	6,230	18,700	18,500
1990	892	2,712	8,860	8,520	8,480
2007	2,010	7,231	37,200	19,800	35,900

There are plenty of reasons to believe that technology can make resources more plentiful, but commodity prices can also be affected by many other factors besides true scarcity such as cartels, speculation, etc. Between 1980 and 1990 all five commodities declined in real price with the basket falling 37%. However, between 1980 and 2007 only two of the five declined in real price with the basket rising 23%, and between 1970 and 2007, only one out of five declined in price with the basket rising 74%.

4. According to Will, “As global levels of sea ice declined last year, many experts said this was evidence of man-made global warming. Since September, however, the increase in sea ice has been the fastest change, either up or down, since 1979, when satellite record-keeping began. According to the University of Illinois’ Arctic Climate Research Center, global sea ice levels now equal those of 1979.”

While there is no officially named “Arctic Climate Research Center,” the Polar Research Group in the Department of Atmospheric Science at the University of Illinois stated in response to the article, author is comparing the GLOBAL sea ice area from December 31, 2008 to same variable for December 31, 1979. In the context of climate change, GLOBAL sea ice area may not be the most relevant indicator. Almost all global climate models project a decrease in the Northern Hemisphere sea ice area over the next several decades under increasing greenhouse gas scenarios. But, the same model responses of the Southern Hemisphere sea ice are less certain. In fact, there have been some recent studies suggesting the amount of sea ice in the Southern Hemisphere may initially increase as a response to atmospheric warming through increased evaporation and subsequent snowfall onto the sea ice.

Observed global sea ice area, defined here as a sum of N. Hemisphere and S. Hemisphere sea ice areas, is near or slightly lower than those observed in late 1979, as noted in the... article. However, observed N. Hemisphere sea ice area is almost one million sq. km below values seen in late 1979 and S. Hemisphere sea ice area is about 0.5 million sq. km above that seen in late

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1979, partly offsetting the N. Hemisphere reduction.

Global climate model projections suggest that the most significant response of the cryosphere to increasing atmospheric greenhouse gas concentrations will be seen in Northern Hemisphere summer sea ice extent. Recent decreases of N. Hemisphere summer sea ice extent are consistent with such projections. Arctic summer sea ice is only one potential indicator of climate change, however, and we urge interested parties to consider the many variables and resources available when considering observed and model-projected climate change. For example, the ice that is presently in the Arctic Ocean is younger and thinner than the ice of the 1980s and 1990s. So Arctic ice volume is now below its long-term average by an even greater amount than is ice extent or area. (<http://arctic.atmos.uiuc.edu/cryosphere/global.sea.ice.area.pdf>)

5. Will also states, “A recent Pew Research Center poll asked which of 20 issues should be the government's top priorities. Climate change ranked 20<sup>th</sup>.” This is simply a logical fallacy. Just because the general public doesn't think this is a priority doesn't mean the general public is right. In fact, the general public's perceptions may have been influenced by the misleading opinions and factual errors published in newspapers like the Washington Post.
6. Will concludes, “Besides, according to the U.N. World Meteorological Organization, there has been no recorded global warming for more than a decade, or one-third of the span since the global cooling scare.” This statement is true but misleading. While 1998 is the warming year on record according to WMO, 8 of the 10 warmest years on record have occurred since 1998 although none have actually eclipsed this number. ([http://www.wmo.int/pages/prog/wcp/wcdmp/documents/WMO1031\\_EN\\_web.pdf](http://www.wmo.int/pages/prog/wcp/wcdmp/documents/WMO1031_EN_web.pdf)) If one only looks at the last ten years, an upward trend cannot be determined. If one looks at the past one-hundred years, the warming trend is very clear. Furthermore, NASA's weather measurements actually list 2005 as the warmest year on record, eclipsing 1998. (<http://data.giss.nasa.gov/gistemp/2008/>)

Overall, and this is my opinion now, this article is an embarrassment to both George Will and the Washington Post. While opinion articles are meant to persuade, they should not do so using erroneous or misleading facts. To reiterate what I have said in class, what is particularly disappointing is that Will wasted valuable column space debating whether warming is actually happening, a question of little scientific debate, instead of arguing what, if anything, we should do about warming, a question of significant real disagreement.