How Rain City Became Smoke City

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"*Ominous Changes In the World's Weather.* Climatologists now blame those recurring droughts and floods on a global cooling trend."
-FORBES MAGAZINE, February 1974

INTRODUCTION

The reaction to this edition of the Guest *Evergreen Virtual Adviser* (EVA) has the potential to be as incendiary as the subject matter itself. Accordingly, before any of our readers get their fur up, let me assure you that Evergreen doesn't believe that emitting 35 to 40 billion tons of CO_2 into the atmosphere every year should be ignored or tolerated.

We also believe there is a bright future for alternatives. In fact, we've had the Solar Yield Cos (basically, alternative energy-based income vehicles similar to master limited partnerships) on our EVA "Like" list since the summer of last year. More importantly, we've purchased a couple of them in our core—or individual security-based—portfolios.

Yet—that great sucking sound you hear is me inhaling deeply—we believe there is more to the climate change story than just anthropogenic (read: man-made) causes. This issue of our Guest EVA brings up some intriguing points of which many of us may not be aware. I will leave it to our more scientifically inclined readers to attack several of the climate change-related contentions in this piece. However, what is undeniable is that the earth has gone through dramatic heating and cooling cycles well before the age of human industrialization.

That said, there are clearly many things that we can do to reduce carbon emissions which, beyond the issue of rising temperatures, would be highly beneficial to the health of mankind. The most rational, in my mind, would be to start with those efforts that don't destroy thousands, if not millions, of jobs (as some have credibly estimated would happen should the developed world attempt to strictly adhere to the Paris Accord). Wouldn't it be great if such an initiative could actually *increase* employment?

For those of us who live in the Pacific Northwest, and have just experienced a mostly glorious summer, this essay is extremely timely. The reason for the "mostly" is that we've had two separate bouts of intense smoke from hundreds of forest fires that have been blazing pretty much non-stop throughout the region since mid-summer. These have literally turned normally pristine areas into something akin to Beijing during the worst of its many smog alerts. Again, the causes are not all related to human activity, including that after the wettest winter in 122 years, we've had one of the driest summers. The abundant moisture fed the growth of forest underbrush and then the hot, rain-free weather turned all of that into perfect kindling.

But there's more to the forest fire story than just an unusual weather pattern. The care we give our national forests—or, rather, the lack thereof—is attracting increasing attention, as well it should. A growing number of experts are questioning the wisdom of not so benign neglect of our precious woodlands…until they catch fire. Then, for the best of intentions, we send in swarms of brave young men and women to extinguish them as quickly as possible. As we've all tragically seen, dozens have lost their lives attempting to control these intense infernos in recent years.

The effect of failure to "prune" our forests—removing excessive underbrush, thinning out unhealthy clustering, and extracting formerly burned trees that continue to "leak" carbon—combined with the interdiction of nature's cleansing action of smaller fires, has turned out to be disastrous.

As a life-long Northwesterner, I've never seen smoke and fires like we've had this year—not even close. Thus, there is an urgent need for preventative maintenance as well as the planting of millions of seedlings in burned areas. Such an effort would require enormous man-, and woman-, power—not to mention billions of dollars of Federal and state government spending, especially out west. But doesn't that seem like a better use of resources than how we squander our national wealth these days? (By the way, I can think of about 10,000 homeless folks, living under the freeways of booming Seattle, who could use some room, board, and gainful employment in the great outdoors.)

Lest you think there is no market connection with this EVA, please don't rush to judgment. As some of you have heard me say, I think there is an uncannily close connection between the guiding policies of the US Forest Service and the Federal Reserve. By suppressing every market hiccup with its monetary shenanigans—and those of its partners in crime overseas—the Fed is allowing the kindling to build up to enormous proportions in the towering and increasingly crowded financial markets. At some point, instead of minor blazes to burn away market overgrowth, like a garden-variety correction, we are likely to get a monster conflagration that may resemble the Crash of 1987.

Ok, it's time to get to the good stuff and our forests are about as good as it gets. They are one of our greatest national assets and they deserve to be protected in much better fashion than we are currently. In the process, we can also drastically reduce the amount of carbon being released into our gagging atmosphere.

Can you say win/win?

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CLIMATE CHANGE, FORESTRY, AND WILDFIRE

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We live in an ice age caused by never ending climate change. You may find this surprising because most people think our climate is supposed to be stable and warm. Ice ages are just something that happened long ago. Think again. The ice age is now and the climate is still changing.

Facts about Climate Change

Mile high sheets of ice slid southward over North America 17 times during the last 1.65 million years. Each time the climate warmed the ice melted, then it returned when the climate cooled. Data from the Vostok ice core from Antarctica, which covers 420,000 years, show that warm periods lasted about 15,000 to 20,000 years and cold periods lasted about 100,000 years. Together they form Ice Ages. We live at the end of the Holocene, the most recent warm period that began 12,000 years ago.

Humans were not present in North America when the temperature dropped during cold periods nor were humans capable of causing the global temperature to rise during warm periods, most of which were warmer than today. The Eemian, the previous warm period that occurred 120,000 years ago, was 9°F warmer than today. Humans, or industrial society, could not have been responsible for causing this warm climate.

Drought is a natural part of climate change. During the Holocene Climatic Optimum (9,000-5,000 years ago), also known as the Great Drought, the climate was 4.14°F warmer than today causing a drought that turned the Great Plains into a desert. Many meadows went dry in the Sierra Nevada and lake levels dropped throughout the West. The drought also robbed the Great Basin of much of its moisture causing ice age lakes to evaporate and form salt flats.

This Great Drought profoundly influenced people and forests throughout North America. Paleoindian tribes in eastern North America thrived because nut-bearing trees such as oak, hickory, beech, and chestnut expanded their range while people who lived on the Great Plains suffered in desert like conditions. This also was the time when thick forests of Douglas fir, western hemlock, and alder spread over vast areas in the Pacific Northwest.

The recent drought in California surprised and troubled residents because they thought it was an unnatural event. On the contrary, droughts are a natural part of the history of California’s climate going back to a time before industrial society released more greenhouse gases into the atmosphere. For example, California’s Medieval period droughts lasted 220 years (AD 892-1112) and 141 years (AD 1209-1350). The last four droughts in California lasted up to 50 years, the most recent being 2013-2016.

Global temperatures have dropped and risen many times since the 4,000-year Great Drought. The global climate grew significantly warmer during the Medieval Warm Period that extended from AD 900 to 1300. Temperatures plummeted again in 1450, taking the world into the Little Ice Age, which ended in 1850. Then the climate began warming again.

The climate was most congenial between 1940 and 1980 when it stabilized. Many people think this 40-year period represents the “Normal Climate” but it was not normal because the climate always changes. Data from NASA show that the temperature rose again after 1980 but warming stopped in 1998. The climate has stayed stable since that time. Jet Propulsion Lab (JPL) scientists say the reason for this lack of continued warming is unknown.

Even so, arctic sea ice is melting, mountain glaciers are retreating, sea level is rising, and the climate is noticeably warmer than in the recent past. This alarms some people because they think the climate is still warming. However, ice doesn’t stop melting just because the climate stopped warming. The climate is already warm enough to cause these changes.

Regardless of the evidence that shows that the global climate changes primarily because of natural forces some people still want to find a way to return the climate back to what they suppose is the “Normal Climate” during the “Good Old Days” between 1940 and 1980. Unfortunately, science is not advanced enough to manage the climate of an entire planet. Therefore, people worried about climate change simplify the problem down to reducing greenhouse gases such as carbon dioxide.

The Causes of Climate Change

Cosmic (extraterrestrial) and geophysical (terrestrial) forces that humans can’t control are the primary causes of ice ages and climate change. For example, renowned astrophysicist Milutin Milankovitch discovered the connection between climate change and cycles in earth’s orbit, tilt, and the wobble the tilt causes as the earth rotates. He demonstrated that these cycles play a dominant role in controlling ice ages and global climate change.

For example, during cold periods earth’s orbit is elliptical in shape with an eccentricity (a measure of the deviation from a circle) approaching 1.0. This causes the earth to move away from the sun during part of its orbit which cools the climate. In contrast, a warm period orbit is nearly circular with an eccentricity that approaches 0.0. This near circular orbit keeps the sun close to earth so that it continuously warms the climate. Earth is currently in a warm period orbit that is nearly circular with an eccentricity of 0.017.

The tilt of the earth is an additional factor affecting climate change. Now earth’s tilt is about 23.50 which is near the warm period angle of 24.50, but it is moving toward the cold period angle of 22.10. This will bring the northern and southern hemispheres closer to the sun. The result is warmer winter air that holds more moisture and cooler summer air that reduces the melting of winter snow. Thus, layer after layer of snow can accumulate and produce ice sheets that grow into continental glaciers.

Sun spots also affect climate change. Sun spots increase and decrease on an 11-year cycle, even though there are variations in solar radiation between cycles intermixed with periods of extended inactivity. For example, during the Little Ice Age sun spots nearly disappeared in a period known as the Maunder Minimum, and the sun dimmed by 0.2%.

Sun spots peaked between 1985 and 1995, the most recent period of global warming. Sun spots and solar radiation declined and peaked two more times at lower levels each time until 2015 when they dropped dramatically. We may be approaching a new solar minimum like the Maunder Minimum that was responsible for the Little Ice Age. This decline in sun spots corresponds with the current period in which the climate has stopped warming.

Emissions of greenhouse gases into the atmosphere from burning fossil fuels may also contribute to our warmer climate, but they are not likely to be the primary cause of global warming. The natural causes of climate change are far more important and beyond human control. For example, carbon dioxide continues to increase in the atmosphere even though the climate stopped warming in 1998.

Some greenhouse gases come from burning fossil fuels while others come from the respiration and decay of living things, wildfires, and volcanic activity, which increased six-fold during the period of Global Warming. Data from the Italian National Institute of Geophysics and Volcanology show that today volcanos are producing about 609 million metric tons of carbon dioxide per year. This is equivalent to 47 percent of the emissions from all registered vehicles in the United States.

Looking back in time, the Vostok Ice Core shows that during the last 420,000 years of climate change carbon dioxide increased 5 times following temperature increases and decreased after temperatures dropped. This means carbon dioxide didn’t cause temperatures to rise or fall, it reacted to temperature changes. In short, a warmer climate increases atmospheric carbon dioxide due to an increase in ocean surface temperatures that causes them to release excess carbon dioxide and because of a rise in the respiration and decay of living things.

The Medieval Warm Period provides further evidence of the possible disconnect between carbon dioxide and its impact on climate change. Atmospheric carbon dioxide is currently at about 400 ppm (parts per million) and it was less than 300 ppm during the Medieval Warm Period when the global climate was 1°F warmer than today. Likewise, carbon dioxide levels were higher than today during the Eemian warm period, 120,000 years ago, when humans were not burning fossil fuels.

This doesn’t mean carbon dioxide isn’t important. It just means the amount of carbon dioxide in today’s atmosphere may be too small to be a dominant factor in Global Warming. For example, during the Mesozoic 252 to 66 million years ago, carbon dioxide reached a high of 1,300 ppm compared to 400 ppm today. It was during this period that the decomposition of living things formed much of our coal and oil deposits and released massive amounts of carbon dioxide into the atmosphere.

The Future of Climate Change

No one can predict the future but it is certain that the climate will change forever. Even so, The United Nations Intergovernmental Panel on Climate Change (IPCC) thinks the global temperature could rise 1.6°F 83-years from now in 2100. However, in 2012 over a dozen computer models could not accurately predict the path of Hurricane Sandy 7 days in advance. Similarly, the IPCC temperature projection is based on 90 computer models that deviate substantially from observed trends in surface and troposphere temperatures. In short, the IPCC computer models that didn't match past trends are unlikely to accurately predict future trends nearly a century in advance.

What Can We Do About Climate Change?

We can do very little to affect climate change because there are so many natural cosmic and geophysical forces involved that are beyond human control. For example, analysis of the Environmental Protection Agency's (EPA) Clean Power Plan shows that it's carbon dioxide regulations would have limited effect on climate change. The analysis estimates that by the year 2100 carbon dioxide in the atmosphere would only be reduced by 2.9 ppm out of the current level of 400 ppm. The estimated reduction in carbon dioxide would only lower the global temperature by 0.0015 to 0.0006°C. This tiny temperature change would come at a cost of $7 trillion in lost GDP by 2029 and the loss of millions of jobs.

Regardless of the limitations we face in controlling climate change we should still do what is reasonable and economically responsible to reduce greenhouse gas emissions. Carbon dioxide is the only major greenhouse gas influencing climate change that we can control with even limited effectiveness. We should also concentrate on ways to adapt to the inevitable natural changes in climate. A good place to start is America's forests because managing them wisely can have a dramatic influence on the health of our forests and their impact on climate change. Wise forest management can also be done at a reasonable cost. What is good for forests is good for the climate.

The Role of Forestry in Climate Change

President Theodore Roosevelt said a century ago that, "The most reprehensible waste is that of destruction, as in forest fires." His comment is as true today as it was then. Teddy Roosevelt founded the "forest conservation" movement to restore America's forests and stop wasteful fires. His solution: protect forests by quickly putting out wildfires.

Unfortunately, the policy of total fire suppression was a disaster. Without naturally occurring fire, and with little or no management in many areas, forests grew thicker and more flammable as the century progressed, especially on national forests. Today horrific wildfires are creating fire-ravaged landscapes, burned homes and wildlife, and silt clogged streams and reservoirs. These monster wildfires are increasing in size and destructiveness each year and they cost millions of dollars to fight. Wildfires also release enormous quantities of carbon dioxide into the atmosphere.

Paleoecological evidence shows that when the climate was cool forest fires were infrequent and large and when the climate was warm forest fires were frequent and light. Today the climate is warmer but instead of small fires we now endure massive wildfires. The only thing that has changed is that we allowed forests to become unnaturally overgrown with too many trees that turn them into tinderboxes. Likewise, the fact that there are too many trees is also the cause of the widespread insect infestations in California and the West that cover mountain sides with the

gray skeletons of decomposing dead trees.

Even more tragic, this destruction of our forests is predictable and preventable. Just look for the thickest forest piled with logs and branches and that is where a catastrophic wildfire will burn or insects will invade and kill the trees. Reduce the number of trees of all sizes and you will reduce the threat. Foresters learned centuries ago in Europe and America that a healthy forest is one that is cared for. Just as a gardener would prune and weed, we must care for our forests through periodic thinning and harvesting to prevent wildfires and insect infestations, and to keep forests productive and healthy.

Wildfire Emissions

Recent research submitted to a referred journal estimated greenhouse gas emissions from California's wildfires that burned public and private forest and brushland during a seven-year period (2001-2007). These wildfires burned 4.1 million acres, destroyed 10,738 structures, caused massive erosion, and killed uncounted wildlife. Greenhouse gas emission estimates from this research provide the most precise and comprehensive available for any state.

The seven years of California wildfires produced 89.2 million metric tons of carbon dioxide from combustion and 144.3 million metric tons of carbon dioxide from post-fire decay. Decay of trees after a wildfire takes about 100 years to complete, although most decay occurs during the first 50 years after a fire. Emissions from post-fire decay represented 67% of the total 233.5 million metric tons of carbon dioxide released into the atmosphere.

In addition, annual wildfire emissions are equivalent to the emissions from 6.9 million cars, which is 24% of the emissions from California's 28.7 million cars. Annual emissions from California's wildfires are also equivalent to those produced from 9.5 (600 megawatt) coal-fired power plants.

Equally troubling, Forest Service data show that each year an average of 38,755 acres of burned forests in California will probably not grow back because the seed trees were destroyed. The Forest Service planted young trees on only 33% of these burned areas allowing 67% to convert to brush. Carbon sequestration on brush fields is only 3.9% of what is stored in forests. This results in a cumulative and near permanent loss of 26,056 forested acres per year, and an unrecoverable loss of 13.3 million metric tons of carbon dioxide per year.

This research also used data from the Angora Fire of 2007, which burned 3,071 acres and destroyed 254 homes in South Lake Tahoe, to estimate the potential reduction of carbon dioxide emissions from post-fire decay. The most effective method is to remove fire-killed trees and make them available for conversion into solid wood products that store carbon. Unfortunately, after 6 months, dead trees deteriorate to the point that they are no longer useful for wood products, so action to remove them must occur quickly. This is important because 50% of wood is carbon that, if not stored, will go into the atmosphere.

Estimates for the Angora Fire also include the potential recovery of carbon dioxide lost to the atmosphere by planting trees that sequester carbon through photosynthesis. This analysis of the Angora Fire demonstrates that quickly harvesting dead trees and planting young trees can recover an estimated 92.9% of the carbon dioxide emitted into the atmosphere from a wildfire within 100 years. Similar results can be expected by adopting this approach in a variety of other forests throughout the West.

Conclusion

The climate may again be shifting to a temporary period of warmer weather. History shows that we can expect droughts to make overcrowded forests more susceptible to catastrophic wildfires. Therefore, if we are serious about climate change then wildfires must be reduced in size and frequency because they are a significant source of greenhouse gas emissions that we have at least some chance of controlling. That means we must thin and harvest overcrowded forests to keep them more open, safe, and healthy. Likewise, we must plant young trees in fire-ravaged forests to bring them back to health and to recover the carbon dioxide that was lost to the atmosphere.

OUR CURRENT LIKES AND DISLIKES

Changes highlighted in **BOLD**.

LIKE

- Large-cap growth (during a correction)
- International developed markets (during a correction)
- Canadian REITs (on a pull-back after a healthy recent run-up)
- Cash
- Publicly-traded pipeline partnerships (MLPs) yielding 7%-12% (we like them even more after their recent correction)
- Intermediate-term investment-grade corporate bonds, yielding approximately 4%
- Gold-mining stocks
- Gold (however it appears overbought for now)
- Select blue chip oil stocks
- Mexican stocks (at lower prices after this year's strong rally)
- Bonds denominated in renminbi trading in Hong Kong (dim sum bonds; **hold off on new purchases for now due to the recent surge in the Chinese currency**)
- Short euro ETF

NEUTRAL

- Most cyclical resource-based stocks
- Short-term investment grade corporate bonds
- High-quality preferred stocks yielding 6%
- Mid-cap growth
- Emerging stock markets, however a number of Asian developing markets, ex-India, appear undervalued
- Floating-rate bank debt (junk)
- Select European banks
- BB-rated corporate bonds (i.e., high-quality, high yield)
- Investment-grade floating rate corporate bonds
- Long-term Treasury bonds
- Long-term investment grade corporate bonds
- Intermediate-term Treasury bonds

- Long-term municipal bonds
- Intermediate municipal bonds with strong credit ratings
- Emerging bond markets (dollar-based or hedged); local currency in a few select cases
- Solar Yield Cos on a pull-back (taking partial profit on these)
- **Large-cap value**

DISLIKE

- US-based Real Estate Investment Trusts (REITs) (once again, some small-and mid-cap issues appear attractive)
- Small-cap value
- Mid-cap value
- Small-cap growth
- Lower-rated junk bonds
- Canadian dollar-denominated bonds (the loonie is currently overbought)
- Short yen ETF (in fact, the yen looks poised to rally)
- Emerging market bonds (local currency)
- Emerging market bonds (local currency)