

Alan Betts, Green Energy Times, 2018 <http://www.greenenergytimes.org>

Alan K. Betts (<http://alanbetts.com>)

This is a collection of my 2018 articles in the Green Energy Times (<http://www.greenenergytimes.org/>).

This series started in 2016. Many of these articles have been edited or updated from articles I wrote for the Rutland Herald, sometimes with different titles and pictures.

They blend science and opinion with a systems perspective, and encourage the reader to explore alternative and hopeful paths for their families and society. They are written so that a scientist will perceive them as accurate (although simplified); while the public can relate their tangible experience of weather and climate to the much less tangible issues of climate change, energy policy and strategies for living sustainably with the earth system.

The politically motivated attacks on climate science by the current president have sharpened my political commentary this year; since climate change denial may bring immense suffering to our children and life on Earth.

I believe that earth scientists have a responsibility to communicate clearly and directly to the public¹ –as we all share responsibility for the future of the Earth. We must deepen our collective understanding, so we can make a collective decision to build a resilient future. *All my articles are available from my web-site, and can be freely reused under a Creative Commons license.*

This pdf document contains the 5 articles as pdfs. Web access to editions and articles can be found at <http://www.greenenergytimes.org/back-issues-download/> [You may have to retype.]

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Betts, Alan, What Kind of America do We Want. Green Energy Times, August 21nd, 2018.

Betts, Alan, Time for Real Change. Green Energy Times, October 28th, 2018.

¹ **Betts, A. K. (2011)**, Communicating Climate Science. *EOS Transactions*, 92, No. 24, 14 June 2011. Available at <http://alanbetts.com/research/paper/communicating-climate-science/#abstract>

The Weather Listens to No Man

By Dr. Alan K. Betts



The impact of accelerating climate change last year has been sobering. High temperatures and drought produced record fires in the western U.S., and the 2017 Atlantic

hurricane season was devastating. Preliminary damage estimates are approaching \$400 billion, twice as much as the 2005 hurricane season. At the end of the year, the Arctic vortex weakened and bitter cold spread across much of Canada and the eastern U.S. for weeks. The current U.S. administration declared the end of climate change, totally unaware of the warm temperatures across Eurasia.

Just ten days before Hurricane Harvey hit Texas, wreaking havoc and causing widespread flooding, the president signed an executive order revoking a set of regulations that would have made federally funded infrastructure less vulnerable to flooding. As a result much of the federal money sent to Texas to rebuild may be wasted on construction that will not protect against rising sea level and the increasing severity of storms.

Washington is facing many irreconcilable conflicts. This is not surprising because the weather doesn't listen to political denial. Just paying for these weather disasters is getting harder, as Congress cuts corporate taxes, rather than introduce an escalating fossil carbon tax to pay for the immense damage that lies ahead.

Strangely and unexpectedly, the background work of the federal government continues. The first volume of the Fourth National Climate Assessment was released on schedule in November (science2017.globalchange.gov/), as mandated by Congress 20 years ago. This excellent report is an authoritative assessment of the science of climate change, dealing with all aspects that affect the U.S. It is a joint effort of all the government agencies along with university researchers, and it is lengthy and very thorough (470 pages). It is an essential document for regional planning. Everything it says flatly contradicts the climate change denial of the executive branch, which was powerless to prevent its publication. Our dysfunctional administration in Washington will now try to figure out how to obstruct the publication of the second volume of this report. Scott Pruitt, EPA administrator, has suggested a red team/blue team debate as a review mechanism for the science, with a hostile red team of climate science critics, perhaps selected largely by the fossil fuel industry and the Heritage Institute. The clear intent is to turn a critical issue for the future of the U.S. and the planet into political theater to spread doubt and confusion. This in turn will lead to more tragedies in the future.

At the November climate change talks in Bonn (COP 23), the official U.S. delegation looked pathetic as it tried to promote the coal industry. The U.S. is now the only country in the world trying to withdraw from the 2015 Paris agreement, which we helped draft. Meanwhile Bloomberg, the former Mayor of New York City, and California Governor Jerry Brown presented the opposite message under the banner of America's Pledge, an initiative to mobilize states, cities, and companies to comply with the U.S. commitment to cut carbon dioxide emissions in the Paris agreement. So far 20 states and more than 50 cities and 1,400 businesses have signed.

Unfortunately, it is already clear that the Paris agreement needs to be strengthened if the world is to meet its climate goal of limiting the rise of global mean temperature to less than 2 degrees C (3.8F). After a plateau that lasted three years, the global emissions of CO2 appear to be rising again,

when we actually need a 3% fall each year for many decades. So everything New England can do to accelerate the green energy transition will benefit us all.

At home here in Pittsford Vermont, we enjoyed the last of the Brussel sprouts and kale at Christmas, which I harvested before the first big snowstorm. My winter spinach is alive under glass and snow, and the rye cover crop is also now covered with snow. There is much we can do to store more carbon in the soil. This benefits the climate, and at the same time, the organic matter stores more water in the soil, which in turn reduces runoff and gives crops greater resilience against drought. We need to understand what is happening on a global scale, but it is critical for our children to develop the resilience of our local agriculture.

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The damages to the infrastructure of Houston, Texas were massive and long-lasting from Hurricane Harvey. Image: transgriot.blogspot.se

Lessons from Winter – A Snowy Winter Gives Way to Spring

By Dr. Alan K. Betts



It has been a chilly and snowy winter in the northeast. While temperatures in the western U.S. and Alaska have been above average, temperatures in the Arctic

have been very high, and the sea-ice cover has reached record low values. As the Arctic warms, the cold polar vortex weakens, and it has become more unstable. There were large exchanges of warm air flowing into the Arctic, and cold polar air sinking into eastern North America and into Europe in March. These air-mass exchanges produce both our cooler winter and the warmer Arctic.

Snow cover also locks in cold temperatures, because it reflects so much of the sun's energy that little snow can melt, until the sun is higher in the sky. But the winter has had some extreme transitions. When warm air came in from the south on January 11-12, temperatures which had been below zero soared to 60 degrees. The snow all melted, and to my surprise, the soil was frozen. I could dig under some of my cover crop.

By late March, we were eating spinach that overwintered in a glass cold frame, mostly buried under snow. Our spring lettuce will soon be ready. The local farmers' market has had mixed salad greens grown in unheated tunnels since mid-February.

Last December, the fuel efficiency of our Prius Prime plug-in hybrid dropped below 100mpg for the first time. The battery is less efficient when it is cold, as 20% of its energy is used to heat the car. In contrast, we average 160 mpg in summer with a mix of short and long-range trips. Our average on the first 14,000 miles is 134 mpg, which means

we are burning only 90 gallons of gas per year. Plug-in hybrids reduce carbon emissions by 80% and are available now.

The global trade issues are in flux. The European Commission has backed a French call to make trade deals with Europe contingent on membership of the Paris climate agreement. This is a step forward towards global responsibility. And a small step towards holding the U.S. government responsible for sacrificing the Earth's climate to protect the financial interests of its fossil carbon sponsors. However, our president believes he can control trade using tariffs, so trade wars threaten.

The deeper economic issue is that climate change denial is driving a huge fossil-carbon bubble. We face the collapse of the perceived value of fossil carbon assets and related industries, as well as the value of coastal property threatened by storm surges and sea level rise. Trillions of dollars of assets will lose their value as climate change accelerates in the coming decades.

At town meetings last month, thirty-five Vermont towns voted overwhelmingly in favor of resolutions seeking climate solutions. They urged the State of Vermont to meet its goals for 90% renewable energy and called for a fair and equitable transition off fossil fuels. The majority of the resolutions also demanded a ban on any new fossil fuel infrastructure, such as natural gas pipelines. This is a stark but encouraging contrast with federal policy.

I am reminded how Vermont conservatives realized long ago that conserving the



Snowy winter in Pittsford, Vermont in mid-March. Photo: Alan Betts

natural resources of the Earth was crucial for our society. Yet strangely in our nation's capital, many that claim to be conservatives do not see that conserving the climate of this planet is crucial for future life on Earth. Morally blind, they would sell our children's future to those who fund their election campaigns.

Yet spring is here again, and I have the delight of planting frost-hardy seeds and transplants to rejoin the cycle of life for another summer.

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Our Responsibility to the Earth

Dr. Alan K. Betts



Spring came late this year, as the daffodils did not start opening where I live in Pittsford, Vermont until April 18, and the forsythia were ten days later. Rain

for days on end from slow moving weather systems led to substantial flooding. The grass grew profusely weeks before it was dry enough to mow. I planted cool weather crops, lettuce, kale and broccoli by the first of May, and by the beginning of June, even the summer squash and tomatoes were growing fast.

Earth Day was a Sunday this year. In the morning, I spoke at the Dorset Church about our failing to accept our deep responsibilities to the Earth. In the afternoon, I spoke to a group called Earth Matters on the green in Manchester, Vermont. The challenge we face is the same whether framed in spiritual or secular language: time is running out for humanity if we continue down the path of mindlessly exploiting the Earth for profit.

The glaring question facing us all is the following: Who is responsible for solving this mess?

In early May, I spent a week in the mountains of Alberta, Canada speaking to an international meeting of hundreds of scientists working on global water and energy issues. The title of this open science conference was "Extremes and Water on the Edge." Introducing the conference, the Deputy Minister of Environment and Climate Change Canada explained how fast the Canadian north is changing as ice, snow and permafrost melt. Planning for the future is well underway, but the adaptation costs are immense. Ironically, Alaska has just the same changing climate but

planning is very difficult, because federal policy requires them to pretend it isn't happening!

As the climate changes, so the global water and energy cycles are changing. The long-frozen north is melting, and floods, droughts and heat waves are becoming more frequent across the globe. Disaster response and future planning for resilience were hot topics. Scientists are in no doubt about what needs to be done to move away from a fossil fuel economy to a renewable energy economy, but, traditionally, scientists have preserved the integrity and independence of science by leaving policy to others. My message to this scientific community was that we have a moral obligation to Earth, especially earth scientists who can see clearly the dire future that lies ahead under 'business as usual.'

This moral responsibility, of course, extends to all of us. It is time for citizens and professionals to speak up for the interests of all our children and life on Earth. We can no longer leave issues of 'policy' to a federal government that is simply ignoring all that we know about the climate system in order to protect the massive investments of the fossil fuel industry (who are bribing them).

Across the U.S. and on a global scale, the renewable energy transition is going nowhere near fast enough to stave off disaster. The Earth's energy imbalance is about 1.3 watts per square meter, and 93% of this extra energy is being stored in the oceans for the decades and centuries to come.



*"Blue Marble,"
January 4, 2012.
Image from NASA.*

This may seem small, comparable to a LED night light, but it is about 250 times as large in total as the entire global electrical energy production. Rising sea level comes from this heating of the oceans, along with the melting of glaciers, which puts all our coastal development at risk. The flooding of New York by hurricane Sandy illustrates what happens when warmer seas give stronger storms with powerful storm surges along with higher sea levels.

So redouble your efforts for the renewable energy transition. Work together to build creative synergistic solutions that will work for everyone, because so much is at stake and discuss openly the moral issues we face with your colleagues and neighbors.

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What Kind of America Do We Want?

Dr. Alan K. Betts



As I write in late July, wildfires are burning across the Eurasian Arctic as temperatures soar. These climate extremes remind us every month of the

urgency of the global renewable energy transition. Unfortunately, the global rise of nationalism is undermining the need to work together to solve these planetary-scale environmental issues.

Protection of the environment was once a national interest, one of the responsibilities of government to take care of the public interest and welfare. For decades, both of the major political parties in the U.S. supported this policy. This was the bargain with capitalist America that left our corporations free to focus on maximizing profit and productivity; while the government took responsibility for the broader long-term interests of society and local and global environmental issues. Now we have moved into a new political era, where this pact has disintegrated, and business and far-right wing groups have combined in an effort to dismantle this essential protective role of government.

For the business world, this is at least comprehensible, because only benefit corporations are committed to making a positive impact on society, their workers, the community and the environment in addition to making a profit. But the other strand, the rise to power of an American version of fascism is new. But it is one we must face, because so much that we treasure both in America and on Earth is at

stake.

Fortunately, this new American fascism is not well-disciplined like earlier versions in Europe in the last century. Unfortunately, its financial resources are large, because it has the backing of many corporations lured by reduced corporate taxes and reduced government regulation. If the gullible electorate can be bought this November, American democracy is in peril. I should say in disclosure that I was a child born into the wreckage of south-eastern England in September 1945, so I have a bleak perspective on fascism.

The president, who yearns to be an absolute ruler, has aligned his interests with the so-called "alt-right," a diverse collection of neo-fascists and white supremacists, along with the evangelical fundamentalists, who believe we should return to a white America with theirs the state religion. Our democracy is threatened because the Republican Party in Congress has abandoned most of its values and principles; and allied itself with this new American fascism that strongly supports the president. Lies, scapegoats and brutality are everywhere.

The Environmental Protection Agency, signed into law by Republican President



Arctic tundra burning. Image: Western Arctic National Parklands.

Nixon in 1970, is also threatened. Its recent corrupt administrator may have been fired, but the mission of the EPA is shifting from protecting human health and the environment to protecting polluting industries. We are undermining the protections of the Clean Air and Clean Water Acts to marginally increase corporate profits. The Republican Party is content with this rejection of its long-held commitments, provided it gets in return re-election payments from these businesses. Access by government scientists to the press has been curtailed to hide the dangers ahead from this policy shift.

Long-term issues like climate change and the need to shift to renewable energy are being buried in today's EPA. The Earth may have almost infinite resources that we

depend on; but since it has no money, it can be ignored, even though the downstream costs for life on Earth have become too vast to contemplate.

But the day of reckoning will come. Our national debt and our future debt to the planet are unpayable. Internally the president is attempting to discredit the federal government, and bully the free press in his quest for power. Externally, he has oscillated between bullying the rest of the world, and cozying up to dictators. All this has led to the collapse of U.S.

authority in the world.

None of this can be papered over by more transparent lies. Sadly, it is hard to confront corruption in our government. It is hard to deal with the conflict between the mythology of our great democracy, with government by the people and for the people; and the callous whims of a president who thinks the U.S. Constitution and the rule of law are dispensable.

But confront we must. The clock is ticking. Our communities and businesses should get together this summer, and ask what kind of America we want.

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Time for Real Change

Dr. Alan K. Betts



Elections are coming up, and if we don't vote for real change this November, many environmental disasters lie ahead. The U.S. is sinking deeper into

a sticky web of lies from which truth, honesty and democracy may not escape. At the national level, this is clear but, even in New England, we are moving politely backwards, as conservative memes get reframed more elegantly but are unquestioned.

I have lived in Vermont as an independent climate scientist for forty years and have watched many Republican and Democratic governors come and go. I have sat on climate-change panels and written climate-change adaptation reports for the state. I have watched a few important steps in the right direction, such as the founding of Efficiency Vermont and some steady solar development. But I have heard many speeches making promises without follow through and seen Vermont slip away from its renewable energy targets and refuse to implement a fossil carbon tax to fund the needed transition.

People and politicians will not discuss the basic truth, that climate change is simply incompatible with 'business as usual.' Refusing to pay for the transition away from fossil fuels means disaster ahead both for humanity and much of life on Earth. This month's special report from the Intergovernmental Panel on Climate Change says disaster is only two decades away. But rather than accept this and start serious planning, we shrink back into the familiar collective delusion: the gospel of economic growth based on a consumer society that is a major contributor to the threat we face.

So let us start here with this delusion. We want to have it all now, as we always have, without thought for the future consequences. Everything we want should be grandfathered in. Our children, equipped with fantastic technology and artificial intelligence, can solve all the problems and deal with any disasters that we are creating for them. The future is not our responsibility, because so much is unknown; while in the thrall of advertising, our current needs are so much clearer.

We revere the global market economy that has created great wealth for some. We admire the successful and pity the desperate poor, both around us and overseas. Someday, the market will lift all boats. Ironically, this has a grain of truth,



Image: www.proyecto40.com

rising sea-level and storm surges will flood the coasts, lift the boats and dash them on the shore.

Industrial growth led us to abandon our responsibility for the future of the Earth. Short-term profits matter more, as people are encouraged to be short-sighted and self-centered. We listen to the oil companies when they say it is unfair to tax fossil carbon, because we want cheap oil. We listen to the conservative fantasy of reducing taxes and deregulation and let the market take care of everything including climate change. All so the rich can get richer and poor poorer, while we all exploit the Earth.

The refrains go on and on. We have never had to pay for the long-term costs of our waste streams. Those scientists must be exaggerating – it can't be as bad

as they say. Anyway, it is the future where so much is unknown – they cannot prove it will happen and perhaps they are wrong. A sea of wishful thinking to protect the status quo of 'business as usual' and grease all the wheels that keep it going. The dreams we need to avoid taking collective responsibility that would drive real change.

Since elections are coming, ask politicians where they stand on key issues and don't accept platitudes.

Do they support the development of local markets where our communities have some control: local food, local power and local industries that can provide us with some security through the transition? Or do they just accept the immorality of 'business as usual' in the amoral global market? How deeply have they considered how our delusions will ruin the Earth and the lives of our children and grandchildren?

Yes, it will take real efforts by our communities and a bunch of creative thoughtful politicians, but time is not on our side, as the oceans warm and rise, and the Arctic melts.

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