

Sierra Club Three Lakes Group

Spring 2019 Newsletter

Three Lakes Group Officers: Roger Blanchard; Chair and Secretary, Carol Ward; Vice Chair and Forestry Chair, Jim Page; Treasurer, Dave Aho; Communications and Internet Technology, Stephanie Aho; Communications, Rich Robinson; Outings Chair, Kathy English; Group Representative

Three Lakes Group Spring Programs

At this point we do not have programs finalized for the spring but we expect to have a program in March and a program in May. Tentatively, the programs will be a panel discussion on the Line 5 oil pipeline and a program on edible and medicinal wild plants. E-mail messages will be sent out to notify you about the dates of the programs when we have the schedule completed.

Spring programs will be held in Crawford Hall, Lake Superior State University at 6:30 pm.

We are planning an environmental film festival for Earth Day 2019 around April 22. The film festival will be held at Bayliss Public Library with possibly one event at LSSU. E-mail messages will be sent out to notify you about the dates and times of the films once we have a schedule completed.

What we are working on

A Year in Review

Bike Friendly Soo

Bike Friendly Soo (BFS) accomplished a number of goals in 2018.

First, we worked with the city of Sault Ste. Marie to complete an application for Bicycle Friendly Community status, which was submitted to the League of American Bicyclists in August 2018. The application has 5 major categories: Engineering, Enforcement, Encouragement, Education, and Evaluation. Each section had multiple questions pertaining to what a city is doing to promote bicycling within the city. After members of BFS had obtained answers to the questions within the sections, the application was submitted to the city for review. After the city reviewed the application, it was sent to the League of American Bicyclists.

The city received notification in November that the city was given Honorable Mention for the application. That is what we had expected for a first time submission. I think there is an excellent possibility of the city receiving Bronze status in 2019 assuming we address the issues that the city is weak in.

The first issue that must be addressed is that of getting someone certified as a League Cycling Instructor (LCI). The League basically requires that a city obtaining Bronze status or higher have a LCI. That person is certified through the League to teach classes in bicycle safety. Certification requires going through a course taught by the League.

The city also has to expand its bicycle infrastructure so that more arterial streets have bike lanes. At this point, Sault Ste. Marie has bike lanes by Lake Superior State University on Easterday Ave. and on 4th Ave. west of the Recycling Center.

Another area which would be very beneficial for the application is to have local schools teach bicycle safety training and have Bike to School events. In that regard, we have met with the principals of Washington and

Lincoln Schools. The principals were receptive to the ideas of having bicycle safety training and Bike to School events. We will also meet with the principal of the Middle School in early 2019.

Second, we completed a Bike Route Guide for the Eastern Upper Peninsula. I personally think the guide is excellent. It has bike routes that start from Sault Ste. Marie, St. Ignace, Pickford, and Rudyard. The guide includes a description of the routes, maps of the routes and information about amenities along routes. Also included in the guide is information on laws concerning biking, bike safety, dealing with dogs, valuable bike accessories for long-distance bicycling, etc.

Third, we had a Bike Rodeo in June to teach children about bike safety. The rodeo consisted of checking bikes for mechanical integrity, fitting bike helmets, and courses that children rode through on their bikes that taught various bike riding skills. A total of 26 children obtained certificates for the rodeo.

Forth, we had a series of slow bike rides to encourage people to get out on their bikes. The rides started at the parking lot across from Bird's Eye Outfitters and went to either Rotary Park or 4 Mile Beach. The maximum number of participants we had on a ride was 13. On the ride to 4 Mile Beach, an angel provided drinks and snacks once we got there. All-in-all, the rides went well.

Lastly, we donated \$1000 for the construction of the Power Canal Trail.

Activities

The following activities are not sponsored by the Three Lakes Group although Three Lakes Group members will be involved in the activities. You are welcome to come but you take full responsibility for anything that may happen to you.

Some of us are having regular snowshoeing/skiing outings, mainly around Sault Ste. Marie. Once the snow melts, we expect to have regular hiking/biking/canoeing/kayaking outings. If you would like notification of these outings, contact me at:

blanchardclimate@gmail.com

We're considering an outing to the home of Kathy and Al English, who live near Trout Lake, to observe the making of maple syrup. The outing would probably be around the middle of March. If you are interested in taking part in this outing, contact me at:

blanchardclimate@gmail.com

North Country Trail Work Session (Tentatively the weekend of May 4) – We'll work on building boardwalk off Tahqua Trail in Tahquomenon Falls State Park. Members of the North Country Trail Association will be in attendance. Contact Roger Blanchard (blanchardclimate@gmail.com) if you are interested in being involved.

What is going on in Climate Science

Whether Americans believe in the work of climate scientists or not, not many people know the basic history of climate science. Below is a condensed history that I wrote recently.

Roger

The History of Climate Science

The history of climate science dates back to the 1820s when Jean Bapiste Fourier, the father of an important mathematical operation called the Fourier Transform - which is used today in chemical instrumentation such as Nuclear Magnetic Resonance Spectroscopy and Infrared Spectroscopy - first hypothesized that atmospheric gases trap heat.

In the early 1850s, Eunice Foote demonstrated qualitatively that atmospheric gases indeed do trap heat. In the later 1850s, John Tyndall made quantitative measurements of the heat trapping capacity of greenhouse gases, including CO₂.

In 1896, the Nobel-prize winning chemist, Svante Arrhenius, published a scientific paper in which he calculated a significant increase in atmospheric temperature with a doubling of the atmospheric CO₂ concentration. He was extending the work of John Tyndall.

In 1912, Popular Mechanics had an article describing how burning coal leads to a warming of the atmosphere due to the heat trapping that occurs from the CO₂ generated by burning the coal. In 1917, Alexander Graham Bell, wrote an article that was parallel to the article in Popular Mechanics.

In the early 1930s, an American physicist by the name of E.O. Hulbert, studied the heat trapping capacity of CO₂ and reached the same conclusion as Arrhenius, that doubling the atmospheric CO₂ concentration would cause a significant rise in atmospheric temperature,

During the late 1930s and beyond, Guy Callendar, a steam engineer, wrote and spoke extensively about the relationship between CO₂ emissions and a warming atmosphere.

In the 1950s, a physicist by the name of Gilbert Plass performed scientific studies on infrared radiation for the U.S. Department of Defense. Based upon his studies, he reached the same conclusion as Arrhenius and Hulbert, that doubling the atmospheric CO₂ concentration would cause a significant rise in atmospheric temperature.

In the 1960s, top U.S. government scientists expressed concern to then president Lyndon Johnson that rising CO₂ levels would create future problems due to warming.

In recent decades, some individuals who question the prevailing scientific consensus on global warming have claimed that scientists in the 1970s were predicting global cooling. Several scientists looked back at the scientific literature and found that that was not the case. Here is a title and abstract of their analysis:

THE MYTH OF THE 1970s GLOBAL COOLING SCIENTIFIC CONSENSUS

Climate science as we know it today did not exist in the 1960s and 1970s. The integrated enterprise embodied in the Nobel Prizewinning work of the Intergovernmental Panel on Climate Change existed then as separate threads of research pursued by isolated groups of scientists. Atmospheric chemists and modelers grappled with the measurement of changes in carbon dioxide and atmospheric gases, and the changes in climate that might result. Meanwhile, geologists and paleoclimate researchers tried to understand when Earth slipped into and out of ice ages, and why. An enduring popular myth suggests that in the 1970s the climate science community was predicting “global cooling” and an “imminent” ice age, an observation frequently used by those who would undermine what climate scientists say today about the prospect of global warming. A review of the literature suggests that, on the contrary, greenhouse warming even then dominated scientists' thinking as being one of the most important forces shaping Earth's climate on human time scales. More importantly than showing the falsehood of the myth, this review describes how scientists of the time built the foundation on which the cohesive enterprise of modern climate science now rests.

At this point, all major national and international scientific organizations agree with the position of virtually all climate scientists, that increasing greenhouse gases increases the average global atmospheric temperature. In the U.S., that includes

the National Academy of Sciences, the American Association for the Advancement of Science, the American Geophysical Union, and American Chemical Society.

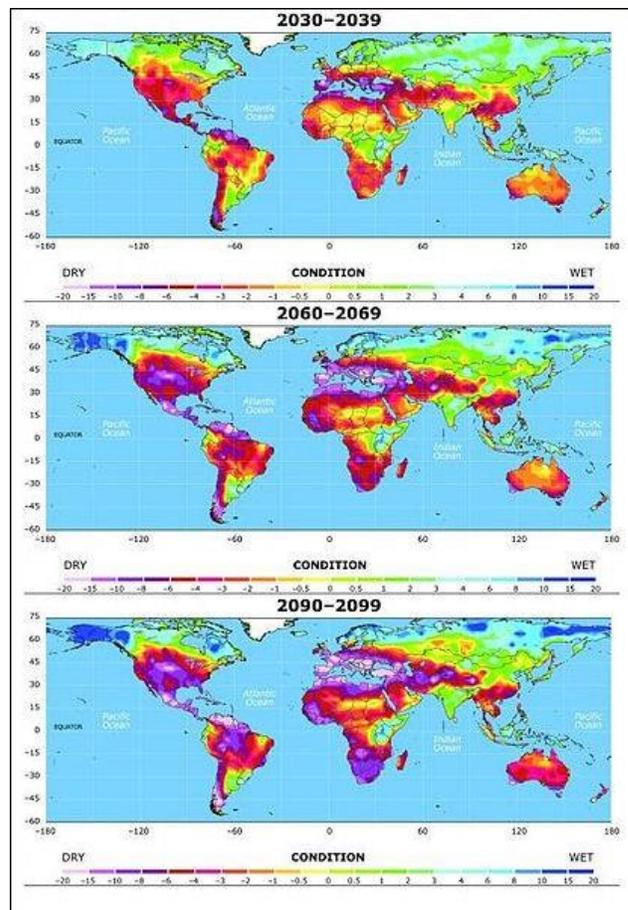
The denial of climate science by those who vocally claim that the science is junk science and that climate scientists are perpetrating a hoax has nothing to do with science and everything to do with greed. The science calls into question the high consumption lifestyle that generally exists in the U.S. and other advanced countries. Truth is often hard to come by and greedy people do not care to admit that the motivation for their denial of the conclusions of climate science is greed.

Commentary by Chris Hedges Concerning Global Warming

In the following commentary, Chris Hedges discusses the possible results of a warming planet. A few clarifications are in order before you read the commentary.

Hedges is presenting some sobering outcomes from warming. A major point that should be made is that a doubling of atmospheric CO₂, which will likely occur this century, would cause an average warming of ~5.5°F. However, warming over continental areas could be 10°F or higher while warming over the oceans would be significantly less than ~5.5°F.

Along with warming over continental areas, the expectation is that many continental regions, such as North America, will get a lot drier (see maps below). The Great Plains may be comparable in dryness to present day Arizona, or worse, by the end of the century.



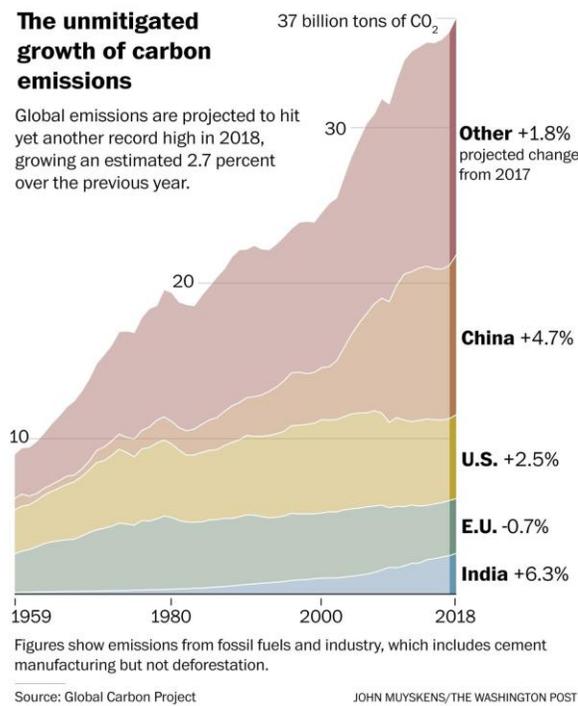
That is expected to have a significant affect upon agriculture. The U.S. relies heavily on irrigation, particularly from the Oglala aquafer in the plains states and the Central Valley aquafer in California. Those aquafers are being

rapidly deleted so that in the future, farmers in those areas will have far less ground water than they have had in the past.

Climate scientists have grown increasingly concerned that humans aren't going to do what is necessary to keep atmospheric CO₂ concentrations within the limit of 2°C (~3.6°F) of warming. Few countries are on target to meet their pledges from the Paris climate agreement and those countries are insignificant in terms of their CO₂ emissions.

I personally think it is unrealistic to believe that humans would actually reduce their emissions to keep the CO₂ concentration below a corresponding limit of 2°C. We're realistically out of time to do that. Americans, and others, live to consume and that consumption involves generating CO₂ and other greenhouse gases. Americans aren't going to stop consuming for any reason other than being forced to by economic conditions.

From 2010 to 2017, global CO₂ emissions increased 6.21% from 30.6 billion tons to 32.5 billion tons. Preliminary data for 2018 indicates that CO₂ emissions increased ~2.7% in 2018 (see figure below).



U.S. CO₂ emissions increased ~2.5% in 2018 (Since this report, I heard that U.S. CO₂ emissions increased 3.4% in 2018). The largest source of CO₂ emissions in the U.S. is the transportation sector, in spite of all the Americans biking and walking wherever they go because of their concerns about CO₂ emissions.

We can, to a degree, reduce per capita CO₂ emissions through technological improvements but not remotely to the degree necessary to hold CO₂ concentrations to a level below 2°C. What climate scientists are concerned with are positive feedbacks that can't be controlled by humans, which are likely to occur above 2°C of warming. We're going to test the effects of positive feedbacks.

Saying Goodbye to Planet Earth

Chris Hedges, August 2018

The spectacular rise of human civilization—its agrarian societies, cities, states, empires and industrial and technological advances ranging from irrigation and the use of metals to nuclear fusion—took place during the last 10,000 years, after the last ice age. Much of North America was buried, before the ice retreated, under sheets eight times the height of the Empire State Building. This tiny span of time on a planet that is 4.5 billion years old is known as the Holocene Age. It now appears to be coming to an end with the refusal of our species to significantly curb the carbon emissions and pollutants that might cause human extinction. The human-induced change to the ecosystem, at least for many thousands of years, will probably make the biosphere inhospitable to most forms of life.

The planet is transitioning under our onslaught to a new era called the Anthropocene. This era is the product of violent conquest, warfare, slavery, genocide and the Industrial Revolution, which began about 200 years ago, and saw humans start to burn a hundred million years of sunlight stored in the form of coal and petroleum. The numbers of humans climbed to over 7 billion. Air, water, ice and rock, which are interdependent, changed. Temperatures climbed. The Anthropocene, for humans and most other species, will most likely conclude with extinction or a massive die-off, as well as climate conditions that will preclude most known life forms. We engineered our march toward collective suicide although global warming was [first identified in 1896](#) by the Swedish scientist Svante Arrhenius.

The failure to act to ameliorate global warming exposes the myth of human progress and the illusion that we are rational creatures. We ignore the wisdom of the past and the stark scientific facts before us. We are entranced by electronic hallucinations and burlesque acts, including those emanating from the centers of power, and this ensures our doom. Speak this unpleasant truth and you are condemned by much of society. The mania for hope and magical thinking is as seductive in the Industrial Age as it was in pre-modern societies.

Ate and Nemesis were minor deities who were evoked in ancient Greek drama. Those infected with hubris, the Greeks warned, lost touch with the sacred, believed they could defy fate, or *fortuna*, and abandoned humility and virtue. They thought of themselves as gods. Their hubris blinded them to human limits and led them to carry out acts of suicidal folly, embodied in the god Ate. This provoked the wrath of the gods. Divine retribution, in the form of Nemesis, led to tragedy and death and then restored balance and order, once those poisoned with hubris were eradicated. “Too late, too late you see the path of wisdom,” the Chorus in the play “Antigone” tells Creon, ruler of Thebes, whose family has died because of his hubris.

“We’re probably not the first time there’s been a civilization in the universe,” [Adam Frank](#), a professor of astrophysics at the University of Rochester and the author of “[Light of the Stars](#): Alien Worlds and the Fate of the Earth,” told me when we met in New York.

“The idea that we’re destroying the planet gives us way too much credit,” he went on. “Certainly, we’re pushing the earth into a new era. If we look at the history of the biosphere, the history of life on earth, in the long run, the earth is just going to pick that up and do what is interesting for it. It will run new evolutionary experiments. We, on the other hand, may not be a part of that experiment.”

Civilizations probably have risen elsewhere in the universe, developed complex societies and then died because of their own technological advances. Every star in the night sky is believed to be circled by planets, some 10 billion trillion of which astronomers such as [Frank Drake](#) estimate are hospitable to life.

“If you develop an industrial civilization like ours, the route is going to be the same,” Adam Frank said. “You’re going to have a hard time not triggering climate change.”

Astronomers call the inevitable death of advanced civilizations across the universe “the great filter.” [Robin Hanson in the essay](#), “The Great Filter—Are We Almost Past It?” argues that advanced civilizations hit a wall or a barrier that makes continued existence impossible. The more that human societies evolve, according to Hanson, the more they become “energy intensive” and ensure their own obliteration. This is why, many astronomers theorize, we have not encountered other advanced civilizations in the universe. They destroyed themselves.

“For a civilization to destroy itself through nuclear war, it has to have certain emotional characteristics,” Frank said. “You can imagine certain civilizations saying, ‘I’m not building those [nuclear weapons]. Those are crazy.’ But climate change, you can’t get away from. If you build a civilization, you’re using huge amounts of energy. The energy feeds back on the planet, and you’re going to push yourself into a kind of Anthropocene. It’s probably universal.”

Frank said that our inability to project ourselves into a future beyond our own life spans makes it hard for us to grasp the reality and consequences of severe climate change. Scenarios for dramatic climate change often center around the year 2100, when most adults living now will be dead. Although this projection may turn out to be overly optimistic given the accelerating rate of climate change, it allows societies to ignore—because it is outside the life span of most living adults—the slow-motion tsunami that is occurring.

“We think we’re not a part of the biosphere—that we’re above it—that we’re special,” Frank said. “We’re not special.”

“We’re the experiment that the biosphere is running now,” he said. “A hundred million years ago, it was grassland. Grasslands were a new evolutionary innovation. They changed the planet, changed how the planet worked. Then the planet went on and did things with it. Industrial civilization is the latest experiment. We will keep being a part of that experiment or, with the way that we’re pushing the biosphere, it will just move on without us.”

“We have been sending probes to every other planet in the solar system for the last 60 years,” he said. “We have rovers running around on Mars. We’ve learned generically how planets work. From Venus, we’ve learned about the runaway greenhouse effect. On Venus the temperature is 800 degrees. You can melt lead [there]. Mars is a totally dry, barren world now. But it used to have an ocean. It used to be a blue world. We have models that can predict the climate. I can predict the weather on Mars tomorrow via these climate models. People who think the only way we can understand climate is by studying the earth now, that’s completely untrue. These other worlds—Mars, Venus, Titan. Titan is a moon of Saturn that has an amazingly rich atmosphere. They all teach us how to think like a planet. They have taught us generically how planets behave.”

Frank points out that much of the configurations of the ecosystem on which we depend have not always been part of the planet’s biosphere. This includes the Gulf Stream, which carries warm water and warm air up from Florida to Boston and out across the Atlantic.

“Hundreds of millions of people in some of Earth’s most technologically advanced cities rely on the mild climate delivered by the Gulf Stream,” Frank writes in “Light of the Stars.” “But the Gulf Stream is nothing more than a particular circulation pattern formed during a particular climate state the Earth settled into after the last ice age ended. It is not a permanent fixture of the planet.”

“Everything we think about the earth just happens to be this one moment we found it in,” he told me. “We’re pushing it [the planet] and we’re pushing it hard. We don’t have much time to make these transitions. What people have to understand is that climate change is our cosmic adolescence. We should have expected this. The question is not ‘did we change the climate?’ It’s ‘of course we changed the climate. What else did you expect to have happened?’ We’re like a teenager who has been given this power over ourselves. Just like how you give a teenager the keys to the car, there’s this moment where you’re like, ‘Oh my God I hope you make it.’ And that’s what we are.”

“Climate change is not a problem we have to make go away, in a sense that you don’t make adolescence go away,” Frank said. “It is a dangerous transition that you have to navigate. ... The question is are we smart enough to deal with the effects of our own power? Climate change is not a pollution problem. It’s not like any environmental problem we’ve faced before. In some sense, it’s not an environmental problem but a planetary transition. We’ve already pushed the earth into it. We’re going to have to evolve a new way of being a civilization, fundamentally.”

“We will either evolve those group behaviors quickly or the earth will take what we’ve given it, in terms of new climate states, and move on and create new species,” he said.

Frank said the mathematical models for the future of the planet have three trajectories. One is a massive die-off of perhaps 70 percent of the human population and then an uneasy stabilization. The second is complete collapse and extinction. The third is a dramatic reconfiguration of human society to protect the biosphere and make it more diverse and productive not for human beings but for the health of the planet. This would include halting our consumption of fossil fuels, converting to a plant-based diet and dismantling the animal agriculture industry as well as greening deserts and restoring rainforests.

There is, Frank warned, a tipping point when the biosphere becomes so degraded no human activity will halt runaway climate change. He cites Venus again.

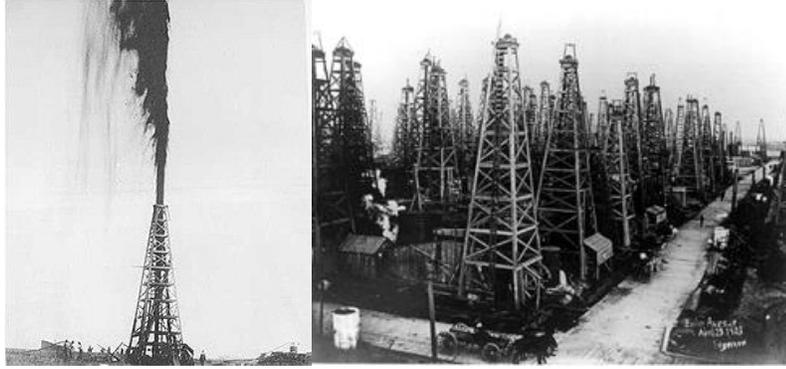
“The water on Venus got lost slowly,” he said. “The CO₂ built up. There was no way to take it out of the atmosphere. It gets hotter. The fact that it gets hotter makes it even hotter. Which makes it even hotter. That’s what would happen in the collapse model. Planets have minds of their own. They are super-complex systems. Once you get the ball rolling down the hill. ... This is the greatest fear. This is why we don’t want to go past 2 degrees [Celsius] of climate change. We’re scared that once you get past 2 degrees, the planet’s own internal mechanisms kick in. The population comes down like a stone. A complete collapse. You lose the civilization entirely.”

What’s Going on with Oil?

"It is likely that in the coming years world oil production will decline (at around 5 percent per year) and that LTO [light tight oil] will decline more sharply. This will come as a shock because it is contrary to the official forecasts, which see oil production rising up to 2040."

Jean Laherrère, retired geologist-geophysicist involved in oil and gas exploration worldwide; from "Thoughts on the Future of World Oil Production," 11/18

The present situation with fracking in the U.S. (light tight oil) reminds me of the Spindletop discovery in Texas. Spindletop was discovered in 1901 and was the first major discovery in Texas.



Here is what it states on Wikipedia about Spindletop:

Spindletop was the largest [gusher](#) the world had seen and catapulted Beaumont into an oil-fueled [boomtown](#). Beaumont's population of 10,000 tripled in three months and eventually rose to 50,000.^[6] Speculation led land prices to increase rapidly. By the end of 1902, more than 500 companies had been formed and 285 wells were in operation.^[3]

Production at Spindletop began to decline rapidly after 1902, and the wells produced only 10,000 barrels per day (1,600 m³/d) by 1904.^[3] (Initial wells came in at ~100,000 b/d).

Those involved in the early production at Spindletop believed that the oil would last forever, or nearly forever. Obviously it didn't. Presently, many of those involved with fracking are giving the impression that oil obtained from fracking will last forever. It won't.

Patillo Higgins was involved with the initial discovery at Spindletop. After the field went bust, he said something to the effect of "Spindletop was milked hard and furthermore not milked too intelligently." The oil industry is presently milking the shale plays hard and I would argue, not too intelligently.

Peak Shale: Is the US Fracking Industry Already in Decline?

By [Justin Mikulka](#), originally published by [DeSmog Blog](#)

- October 31, (Light 2018)



In 2016, lower oil prices led to an overall drop in production for shale companies, which use horizontal drilling and fracking to extract oil and gas from shale formations such as the Marcellus and Permian. This was one of the few relatively positive financial periods for an industry plagued by high costs and low returns (although it still lost money in 2016).

But the industry shouldn't get complacent, warned Robert Clarke of energy industry research and consulting group [Wood Mackenzie](#). Cracks already are starting to emerge in the optimistic forecasts of how much these shale formations can produce, which is a bad sign for turning around the industry's struggling finances.

"It was only the best rigs, with the most experienced crews, drilling the best rock at the lowest service costs," which were doing well in 2016, said Clarke at the [2018 Energy Information Administration \(EIA\) annual conference](#) in June. "If you are a producer, it's very dangerous to think that that is the new norm."

But producers seemed to think it was the new normal and plowed ahead, going all in on fracking in the Permian Basin, currently seen as the best shale play in the country.

Granted, the results have been impressive from a production standpoint. [The EIA](#) expects "Permian regional production to average 3.3 million [barrels per day] in 2018 and 3.9 million [barrels per day] in 2019." Those numbers may reach [5.4 million barrels a day](#) by 2023, according to oil industry consultants IHS Markit.

While the Permian's oil production has been prolific, it hasn't translated into profits. "[Why Aren't Permian Oil Producers Profitable?](#)" asked a headline on industry publication Oilprice.com this past May.

As DeSmog's series on the [finances of fracking](#) has documented, there is no doubt fracking can lead to production of large volumes of light oil, but it comes at the cost of approximately a quarter trillion dollars more than the industry has made since 2007.

World's Largest Oil Services Company CEO Offers Dire Warning for Frackers

As the world's largest oil services company, Schlumberger has an intimate knowledge of what it takes to produce oil by fracking across the many shale formations currently being drilled.

Its CEO, Paal Kibsgaard, cautioned industry analysts on a recent phone conference, sounding quite like the warning from Clarke in June.

"The well-established market consensus that the Permian can continue to provide 1.5 million barrels per day of annual production growth for the foreseeable future is starting to be called into question," Kibsgaard said, according to the [Financial Times](#).

Kibsgaard's main concern touches on a phenomenon known as "child wells," [a situation I reported for DeSmog in August](#).

The concept is simple. All shale formations are not created equal, which means to make money, producers need to find "good rock," or what is also known in the industry as "sweet spots."



Pumpjack located south of Midland, Texas. Credit: Eric Kounce, [TexasRaiser](#), public domain

But there are limited sweet spots. And the industry is drilling too many "child wells" in established sweet spots around "parent wells" that are producing, hoping to capitalize on that "good rock." But, [as I explained](#), the approach isn't working, and in some cases is even costing the industry more money by damaging the existing wells in those sweet spots.

But that raises a simple question: If the shale industry has an abundant enough supply of good rock to support the rosy predictions of groups like IHS, why are companies instead drilling so many child wells around a few sweet spots instead of moving on to drill other, new sweet spots?

Perhaps the industry doesn't have other sweet spots to move on to and perhaps instead is trying to stave off looming bankruptcy from the [tremendous debt loads](#) they are carrying?

Kibsgaard explained his skeptical view of the Permian basin's future production, saying that in the Eagle Ford shale play — where production is well below its peak in 2015 — “up to about 70 percent of all new wells drilled” are child wells. This trend indicates that producers there have run out of new “good rock” and are trying to get every last bit from the known sweet spots.

Meanwhile, in the Permian's Midland Wolf Camp section, child wells are already approaching 50 percent of new wells drilled, said Kibsgaard, and the results appear to follow the same trajectory as the Eagle Ford.

“We are already starting to see a similar reduction in unit well productivity to that already seen in the Eagle Ford suggesting that the Permian growth potential could be lower than earlier expected,” warned Kibsgaard.

This is the message from the CEO of the biggest oilfield services company to investment analysts. Will anyone listen?

Some Fracking CEOs Make Similar Warnings

Schlumberger isn't in the business of drilling for oil, just supporting the companies that do. So putting forth rosy projections for the future to keep investors engaged isn't required — like it may be for [fracking companies deeply in debt](#) and unable to turn a profit at current production levels. Promises of huge profits in the future are really the only likely reason for anyone to invest in fracking companies.

But even some fracking CEOs don't believe the optimistic forecasts for the Permian. In Bethany McLean's excellent new book [Saudi America: The Truth About Fracking and How It's Changing the World](#), she speaks to two of the fracking CEOs who have actually had success in the industry — Bill Thomas and Mark Papa.

Bill Thomas, current CEO of EOG (formerly known as Enron Oil and Gas), one of the few fracking companies [making money](#), tells McLean that in the Permian the “really good rock” is smaller than the industry optimists are saying. This helps explain the surge in child wells where the industry is trying to over-drill what good rock there is.

Thomas goes on to explain to McLean: “The Permian has terrified the world oil market but there are overblown expectations of the Permian.” “Terrified” because if the Permian actually manages to produce 5.7 million barrels per day, it would be producing a higher volume of oil than every country except the U.S., Saudi Arabia, and Russia in 2017.

Oil traders and producers don't like to be surprised and having a new oil supply of that magnitude come out of almost nowhere fits that bill. But as Thomas is warning, those fears may not be fully justified.

Mark Papa is the former CEO of EOG and now runs Centennial Resource Development. Papa actually delivered his less-than-sunny message at the 2018 IHS Markit annual oil industry conference known as CERAweek, but apparently it wasn't what the audience wanted to hear.

“There are good geological spots in shale plays and weaker geological spots, and a lot of the good geological spots have already been drilled,” [Papa explained](#) during a panel discussion.

In Saudi America, McLean reports that Papa had said that by 2020, even in the Permian, the best acreage will have been mostly drilled and he predicted a sizable drop off in production to follow.

Time Running out for Frackers in Deep Debt

At current oil prices, most fracking companies are losing money while trying to get every last drop out of the known sweet spots in American shale plays. Under these conditions, the industry is having a hard time accepting that what Papa, Thomas, and Kibsgaard are saying could be true. These companies can't hope to pay back their massive debts if the best days of the major shale plays are either in the past or rapidly approaching.

So, who will be right? For nearly a decade, the fracking industry has been promising that profits are just on the horizon, but they have not materialized — not even in the ideal 2016 scenario described by Wood Mackenzie's Clarke.

Has the industry run out of good rock? In her book, McLean quotes one industry investor, whose words should strike fear into the hearts of those invested in or holding debt for shale companies.

“Our view is that there's only five years of drilling inventory left in the core,” one prominent investor told McLean, whose book was just published in September 2018. “If I'm OPEC, I would be laughing at shale. In five years, who cares?”

Much has been made of the increase in U.S. oil and natural gas production by politicians and the media over the last 10 years due to fracking. That increase in production has been made possible by a sea of debt. Over the years, the oil and gas industry has been piling on more debt to cover previous debt. What they are doing constitutes a Ponzi scheme.

Climate by the Numbers

Below is a table containing temperature deviation data for December 2018, year 2018 and the 9 years of the decade 2010-2019 (2010-2018) relative to the average for 1971-2000 for 9 northern North American locations.

Location	December 2018 Temperature Deviation relative to 1971-2000	Year of 2018 Temperature Deviation relative to 1971-2000	2010-2018 Temperature Deviation relative to 1971-2000
Prudhoe Bay, AK	6.08	5.58	4.41
Moosonee, Ontario	5.35	-0.20	2.44
Nome, AK	-3.73	4.06	1.77
Churchill, Manitoba	5.82	0.98	2.88
Iqaluit, Nunuvut	8.84	0.37	2.57
Goose Bay, NFL	4.49	0.45	2.16
Yellowknife, NWT	9.90	1.01	2.89
Sault Ste. Marie, MI	5.94	2.80	2.85
Hibbing, MN	4.61	-2.15	0.31
Average	5.26	1.43	1.99

Table I

It was extremely warm over Alaska for the year, particularly Prudhoe Bay. Table II shows the monthly temperature deviations relative to 1971-2000 averages.

Prudhoe Bay Temperature Deviations, Relative to 1971-2000, for 2018

Month	Temperature Deviation (oF)
January	+8.61
February	+20.93
March	+14.71
April	+4.47
May	-1.26
June	-2.55
July	+3.56
August	-5.42
September	+0.87
October	+8.11
November	+10.00
December	+6.08

Table II

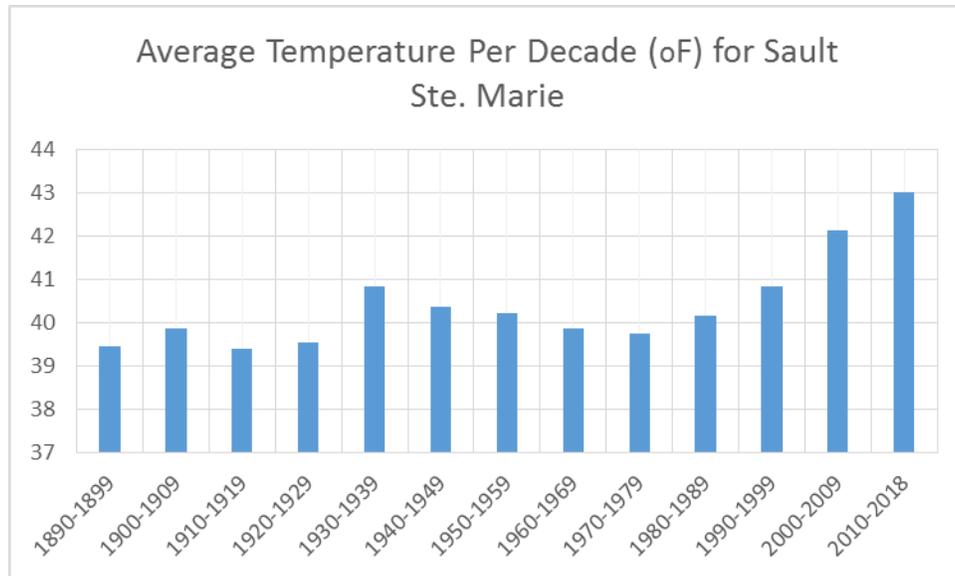
A significant reason for the warm temperatures in Alaska is that there was a fairly persistent jet stream pattern that was bringing warm air up to Alaska and cold air down from the Arctic east of Alaska. Another factor, in terms of Prudhoe Bay, is that the Arctic Ocean is staying open longer during the year and heat is being transferred from the ocean to the atmosphere leading to higher temperatures in Prudhoe Bay, particularly in the fall and into the winter. Noteworthy on the cool side was Hibbing, MN which had 9 months below the 1971-2000 averages. It seems like a cold air mass got stuck over northern Minnesota during 2018.

Table III has average temperature data per decade from 1890-2018 for Sault Ste. Marie:

Decade	Average Temperature (°F)
1890-1899	39.47
1900-1909	39.86
1910-1919	39.40
1920-1929	39.56
1930-1939	40.84
1940-1949	40.36
1950-1959	40.23
1960-1969	39.86
1970-1979	39.77
1980-1989	40.18
1990-1999	40.85
2000-2009	42.14
2010-2018	43.02

Table III

Year 2018 was the 13th warmest year on record dating back to 1890 for Sault Ste. Marie. 2018 was cooler than many years during this decade but still considerably above the 1971-2000 average. Graph I is a graph of the data in Table III.



Graph I

Web Page and Facebook

We're on the Web and Facebook. The addresses are:

<http://tlgsierraclub.org/>

<https://www.facebook.com/ThreeLakesGroupOfSierraClub?ref=bookmarks>

Please take a look at what we have online. We'll try to supply material regularly to these sites. Feel free to contact us with questions, concerns and suggestions.

Three Lakes Group Meetings

If you would like to attend Three Lakes Group meetings, send me an e-mail at:

blanchardclimate@gmail.com

and I will put you on the list.
