

## The Chronicle

By Alice Loyd (through October 31, 2015)

### THE POWERS

It is increasingly understood that our age is dominated by corporations and by the most wealthy families and individuals. In the past, we have noted that income inequality is a growing concern worldwide. With this issue we begin tracking news that is specifically about the “one percent” and the business organizations US law treats as persons. “Who really rules?” was the question posed by researchers in a new study from Princeton University, and the conclusion is that “over the past few decades America's political system has slowly transformed from a democracy into an oligarchy, where wealthy elites wield most power.” On July 30, 2015, former US President Jimmy Carter said the United States is now an “oligarchy” in which “unlimited political bribery” has created “a complete subversion of our political system.”

[talkingpointsmemo.com](http://talkingpointsmemo.com) and [theintercept.com](http://theintercept.com)

**How influential in Earth affairs are these “powers”? Consider the example of Exxon.** In

September, 2015, *Inside Climate News* revealed that from the late 1970s to the mid-80s Exxon scientists “engaged in an ambitious quest to comprehend the potentially devastating effects that carbon dioxide emissions could have on the climate.” These scientists worked at the cutting edge of climate change research and found “carbon dioxide accumulating in the upper atmosphere would warm the planet and if the CO<sub>2</sub> concentration continued to rise, it could harm the environment and humankind.” During those years the company considered gradually shifting from oil to



become a diversified energy company. It explored ways to encourage more efficient consumption of petroleum and to make photovoltaic solar cells more efficient. By 1989, however, Exxon had reviewed the scientists’ warnings as well as the possible impacts on profitability if CO<sub>2</sub> emissions were reduced, and made the decision to go with the money. Exxon documents show that top level senior managers were aware of their scientists' early conclusions “that continued burning of fossil fuels posed great peril to humankind,” but they have spent the next quarter of a century discrediting that research. [insideclimatenews.org](http://insideclimatenews.org) The corporation has given about \$30 million to global warming disinformation researchers and activist groups during these years, according to Greenpeace. It pledged to stop such funding in 2007 in response to pressure from shareholder activists, but since then Exxon has given more than \$2.3 million to members of Congress and to a corporate lobbying group in order to block efforts to fight climate change. [theguardian.com](http://theguardian.com)

Exxon’s decision has been financially rewarding for the company and its leaders. CEO Rex Tillerson was paid \$33 million in 2014. [ips-dc.org/pensions](http://ips-dc.org/pensions) His total compensation over the last

five years was \$165 million, and his retirement assets total \$68 million, 17<sup>th</sup> among Fortune 500 chief executives. [ips-dc.org.pdf](#) The corporation itself was either the largest or the second largest company in general, worldwide, measured by revenue for the years 2010 through 2014. [statista.com](#)

The decision that brought financial benefit to a few has harmed the planet as a whole. If there were an index to rank corporations in terms of global criminal acts, Exxon would sit near the top. The campaign to discredit climate change science and prevent CO<sub>2</sub>-reduction policies has been extraordinarily successful. As Bill McKibben wrote in an email to 350.org members on October 30, 2015, “Just think how much would be different if Exxon had told the truth. We wouldn’t fully have solved global warming but we’d be well on the way—there would have been no 25-year phony pretend debate.” [350.org](#)

**Another “power” not telling the truth has also been in the news—Volkswagen.** That company’s cover-up may rank lower on the scale of global ecological influence, but VW diesel owners who bought their cars in an effort to help the climate have loudly expressed disillusionment. On September 18, 2015, the US Environmental Protection Agency announced that 482,000 VW diesel cars on American roads were emitting up to 40 times more toxic fumes than permitted, and later Volkswagen admitted the condition affects 11 million cars worldwide. That means more harmful mono-nitrogen oxide (NO<sub>x</sub>) emissions have been pumped into the air than was thought—an amount equal to all of the United Kingdom’s “NO<sub>x</sub> emissions from all power stations, vehicles, industry and agriculture. VW’s ‘defeat device’ is not a physical device but a programme in the engine software that lets the car perceive if it is being driven under test conditions - and only then will it pull out all the anti-pollution stops.” [theguardian.com](#). Martin Winterkorn, the CEO of Volkswagen who resigned on September 22, 2015, following the scandal, was the second-highest paid CEO in Europe at approximately \$18.5 million per year. His pension is reported to be approximately \$32 million. [fortune.com](#)

## CLIMATE

**A number of environmental tragedies making the news are related to climate change.** Peat fires in Indonesia have consumed about 8,100 square miles of forests and peatland, an area larger than New Jersey. At least nineteen people have died by our date of publication, and a large part of Southeast Asia, including Singapore and parts of Malaysia, Thailand, and the Philippines, is bathed in a toxic haze. The fires have been set, legally and illegally, by farmers clearing the land for paper and palm oil plantations—a common practice that governments have failed to control to this point. This year extremely dry conditions caused by the strong El Niño have made the fires worse, with worse outcomes not only for humans and for the animals, many of them unique to this region, but also for the upper atmosphere. So far this year the fires have released more greenhouse gases than all the fossil fuels burned annually in Germany—more daily emissions on at least 14 days than China, and more on at least 38 days in September and October than the entire United States economy. The fires were high on the agenda when Indonesian President Joko Widodo came to Washington for talks with President Obama in late October. Obama committed \$2.75 million to help respond to haze-related respiratory illnesses,

provide protective gear for firefighters, and monitor the blazes through the US Forest Service's remote sensing and imaging systems. Widodo has said he will ban the commercial destruction of any more peatlands, but enforcement of that policy will be difficult. [washingtonpost.com](http://www.washingtonpost.com), [gq.com](http://www.gq.com), and [vox.com](http://www.vox.com)

**By the end of this century, areas of the Persian Gulf could be hit by waves of heat and humidity** so severe that simply being outside for several hours could threaten human life according to a study published by the Massachusetts Institute of Technology in the journal *Nature Climate Change* on October 26, 2015. Researchers used a method of measuring atmospheric conditions known as wet-bulb temperature, which shows the extent to which evaporation and ventilation can reduce an object's temperature. If the wet-bulb temperature is 95 degrees Fahrenheit (35 degrees Celsius), even a person drenched in sweat cannot cool off. A wet-bulb reading of 95 degrees Fahrenheit (using a special bulb wrapped in a moistened cloth) would equal a heat-index reading of 165 degrees. The heat index is the temperature felt by the skin due to the humidity level rather than the air temperature. Since even today's heat waves cause thousands of deaths, the more extreme conditions envisioned in the paper "would probably be intolerable even for the fittest of humans, resulting in hyperthermia" after six hours of exposure. "This limit was almost reached this summer, at the end of an extreme, weeklong heat wave in the region: On July 31, the wet-bulb temperature in Bandahr Mashrahr, Iran, hit 34.6 C -- just a fraction below the threshold, for an hour or less." [sciencedaily.com](http://www.sciencedaily.com)

**Perhaps because of extreme weather events already occurring, 54 percent of self-described conservative Republicans in the United States** are now willing to accept that climate change is real and that humans have played a role in it according to a survey announced in late September. The survey found that fewer than a third of Republicans think the climate is changing because of purely natural cycles, and only nine percent think the climate is not changing at all. Eighty-seven percent of conservative Republicans said they supported such policies as installation of rooftop solar panels if they would allow homeowners to save money by selling electricity back to the power company. Sixty-six percent would support requiring electric utilities to include renewable power in their generation mix. [nytimes.com](http://www.nytimes.com)

## ANIMALS



**Scientists now estimate that at least 211,000 endangered saiga antelopes in Central Asia—more than half of the species—died in May 2015** in less than a month's time. At a scientific meeting in late October, 2015, in Tashkent, Uzbekistan, Dr. Richard A. Kock of the Royal Veterinary College in London and his colleagues reported they had narrowed down the possible culprits. Climate change and stormy spring weather, they said, may have transformed harmless bacteria carried by the antelopes into lethal

pathogens. Necropsies revealed internal bleeding, and blood testing showed that the saigas suffered massive infections of bacteria called *Pasteurella multocida* and *Clostridium*

perfringens. Once individual saigas became ill, they typically died within hours. Entire herds were quickly wiped out. Saigas are unusual creatures, noted by naturalists for their fleshy, cartoonish noses resembling an elephant's trunk in miniature. Until the 20th century, great herds, migrating hundreds of miles each year, swarmed across the Central Asian steppes. They play a critical role in the ecosystem of the arid grassland where the cold winters prevent fallen plant material from decomposing. Their grazing helps to break down that organic matter, which recycles nutrients in the ecosystem and prevents wildfires fueled by too much leaf litter on the ground. [nytimes.com](http://nytimes.com) and [livescience.com](http://livescience.com)

**World numbers of the scombridae family of fish, which includes mackerels, tunas, and bonitos, fell by 74 per cent** between 1970 and 2012. The overall decline estimated for 1,234 ocean species over the same period is 49 per cent. Half of the total population of marine species has been lost since 1970 according to the *Living Blue Planet* report released in September by World Wildlife Fund and the Zoological Society of London. Causes of decline are listed as overfishing; pollution—including plastic detritus which can build up in the digestive systems of fish; habitat destruction, such as with coastal mangrove swamps; climate change, which causes ocean warming; and ocean acidification. Ocean acidification is related to climate change in that both are caused by carbon dioxide emissions—in the case of climate change there is a buildup of carbon dioxide in the atmosphere and in the case of acidification there is absorption of carbon dioxide in the aquasphere. [gulfnews.com](http://gulfnews.com) and [worldwildlife.org/publications](http://worldwildlife.org/publications)

**Ocean warming combined with the strong El Niño is triggering a third major global coral bleaching event.** In 1998, a huge underwater heatwave connected with the El Niño of that year killed 16% of the corals on reefs around the world. The second global bleaching event was related to the El Niño of 2010. Scientists expect the 2015-2016 season to impact approximately 38% of the world's coral reefs and kill over 4,500 square miles (12,000 square kilometers) of reefs in the Indian Ocean, the Pacific Ocean including Hawaii, and the Atlantic-Caribbean basin. Coral reefs comprise far less than one percent of the ocean's total area, but they're vitally important both to ecosystems and to people who depend on them. "One in every four species of fish lives on a coral reef, there are over a million species that live on coral reefs," said Ove Hoegh-Guldberg, director of the Global Change Institute at the University of Queensland and chief scientist at the XL Catlin Seaview Survey. "Coral reefs provide food and livelihood to 500 million people," he said. When corals experience, for an extended period, waters warmer than they evolved to live with, they become stressed. The stress causes them to shed the symbiotic algae that provide corals with both their nutrients and their color. Without the algae, they are weakened and susceptible to coral die-off. Because the phenomenon of coral bleaching is so closely connected to ocean temperature, scientists can now use computer models to predict coral bleaching events ahead of time. [washingtonpost.com](http://washingtonpost.com) and [globalcoralbleaching.org/](http://globalcoralbleaching.org/)

**On September 9, 2015, McDonald's announced plans to switch to 100 percent cage-free eggs for its US and Canadian operations**—a move Humane Society US says will spare nearly eight million animals each year from the currently-standard practice of life inside cramped cages. Immediately Burger King, Nestlé, Sodexo, Aramark, Heinz, Starbucks, Compass Group, and

others announced similar conversions to 100 percent cage-free eggs. Four years ago McDonald's phased out pork from operations that confine breeding sows in gestation crates. [humanesociety.org/news](http://humanesociety.org/news)

**Weather patterns encouraged heavy bird migrations in September 2015**, and the beams of the Tribute in Light memorial in New York City on 9/11 attracted the largest number of birds seen there since 2010. The twin beams representing the fallen towers of the World Trade Center were turned off shortly after 9 p.m. to allow confused birds to escape the light and continue on their way. The lights were turned back on about twenty minutes later, only to be turned off again around 10 p.m. They were turned on once more at 10:15 but turned off a third time around 10:50 p.m. [newyork.cbslocal.com](http://newyork.cbslocal.com)

## POLLUTION

**On October 7, 2015, scientists announced there is another contributor to coral bleaching: sunscreen.** Oxybenzone, the active ingredient in many sunscreens, can make the delicate coral polyp more vulnerable to bleaching. An international group of researchers publishing in *Archives of Environmental Contamination and Toxicology* examined the effects of oxybenzone on the larval form (planula) of the coral *Stylophora pistillata*. They found the chemical deforms coral cells, damages their DNA, and, most disturbing of all, disrupts coral larvae endocrine hormones, causing baby coral to encase themselves in their own skeletons and die. After gathering samples of adult and larval coral cells from seven coral species found near the US Virgin Islands, Hawaii, and Israel, researchers discovered that even the tiniest amount of sunscreen—washed off a swimsuit or flushed down a shower drain and into the ocean—can make the delicate coral polyp more vulnerable to bleaching. Oxybenzone can deform coral cells at a concentration as low as 62 parts per trillion. That's one drop in a volume equal to 6.5 Olympic-sized swimming pools. [motherjones.com](http://motherjones.com) and [link.springer.com](http://link.springer.com)

**A side effect of oil and gas production that has worsened with the past decade's drilling boom is wastewater spills.** More than 180 million gallons of wastewater was spilled from 2009 to 2014 in incidents involving ruptured pipes, overflowing storage tanks, and even deliberate dumping—21,651 individual spills. Spills of wastewater can be more damaging than oil spills, since microbes in soil eventually degrade spilled oil. With wastewater, also known as brine, produced water, or saltwater, salt-saturated land dries up, plants die, and nothing can take root in that spot. The data was obtained from the states that account for more than 90 percent of US onshore oil production—Texas, North Dakota, California, Alaska, Colorado, New Mexico, Oklahoma, Wyoming, Kansas, Utah, and Montana. The amount spilled doubled from 21.1 million gallons in 2009 to 43 million in 2013, although the numbers are incomplete because many releases go unreported. "Oil spills may look bad, but we know how to clean them up," said Kerry Sublette, a University of Tulsa environmental engineer. "Brine spills are much more difficult." In addition to extreme salinity, the fluids often contain heavy metals such as arsenic and mercury. Equipment malfunctions or human errors cause most spills, according to state reports reviewed by the Associated Press. [bismarcktribune.com](http://bismarcktribune.com)