The Chronicle
by Alice Loyd

CULTURE

A revived interest in religion in China has inspired environmental activism. In recent years hundreds of millions of people have turned to religions like Taoism, Buddhism, Christianity and Islam, and as they do they are starting social service organizations to oppose polluters, and citing their faith to protest plans to build factories and power plants. Martin Palmer, the secretary general of the Alliance of Religions and Conservation, a group that works with Chinese spiritual leaders, said, "People are asking, 'How do you make sense of your life?' An awful lot are looking for something bigger than themselves, and that is increasingly the environment." The Chinese government, which regulates worship and limits activism, has so far tolerated the rise of religious environmentalists. President Xi Jinping has championed the study of Chinese traditions, including Taoism and Confucianism, in part to counter the influence of Western ideas in Chinese society. Mr. Xi has called for a return to China's roots as an "ecological civilization"—a term familiar to readers of *CES Musings* who may not know it originated in China. nytimes.com

The North Carolina Moral Mondays movement goes nationwide. As the Rev. Dr. William J. Barber II spoke to his congregation in Goldsboro, NC, on this past Easter Sunday, 20,000 people were watching on Facebook Live. A June 29, 2017, article in the *Washington Post* attributed the growing interest in Barber's mix of piety and politics to the hope for "a different kind of resurrection." His message of a common moral duty helped to build a racially diverse coalition of believers and nonbelievers—80,000 people showed up for a Moral Monday demonstration in February of this year—that is making inroads against some of North Carolina's most regressive legislation in decades. In April Rev. Barber began a 22-state tour, where he and members of one of the groups he leads, Repairers of the Breach, are pushing what they call a "broad social justice agenda" to help build integrated movements addressing poverty, voting rights, health care, LGBTQ, worker, and immigrant rights, women's issues, and the degradation of the environment. "This moment requires us," Barber said in the speech announcing his resignation as NC NAACP President in order to widen his ministry, "to push into the national consciousness, but not from the top down, but from the bottom up." washingtonpost.com

Counter to a racially diverse movement is a steady trend by non-college educated whites toward the Republican party regardless of who the candidates are—based on racial concerns. Voter Study Group researchers, in conjunction with the polling firm YouGov, repeatedly surveyed the same panel of 8,000 voters before and after the 2012 election, and then again before and after the 2016 election. The process allowed them to see how individual voter's preferences changed over time. "If you look at this long list of attitudes that were measured," commented researcher John Sides, a political scientist at George Washington University, "only three became more strongly associated with a vote in 2016: your views of immigration, your views of African Americans, and your views of Muslims." Those who thought the economy was

doing poorly tended to vote for the Republican candidates in both elections, but "a really good predictor of whether you supported Trump in the Republican primary wasn't so much 'Are you worried about losing your job?'—pure economic anxiety—as it was 'Do you think that whites lose out on jobs because they have to be given to minorities?'" He concludes that "if economic anxiety mattered (in the 2016 election), it was because it was bound up with concerns about my group's status versus this other group's." thenation.com

CLIMATE

"The Uninhabitable Earth" by David Wallace-Wells, which appeared in *New York* on July 10, 2017, is the most-read article in the magazine's history. nymag.com The long article catalogued worst-case climate scenarios regarding heat, food ("the end of food"), air quality, plagues, and war, and offered a doomsday perspective that attracted criticism perhaps more than praise, including comments from highly respected climate scientist Michael Mann on Facebook, who called the framing "doomist." Mann's post says, "The article paints an overly bleak picture by overstating some of the science. It exaggerates for example, the near-term threat of climate "feedbacks" involving the release of frozen methane. The science on this is much more nuanced and doesn't support the notion of a game-changing, planet-melting methane bomb." Facebook Wallace-Wells maintains his article fills a need. Scientific reports tend to understate the risks of inaction, he says, and "It is important to contemplate the possibility that parts of the tropics and equator will become cripplingly hot, for instance, or that our agriculture will suffer huge losses, so that we may be motivated to take action before we get to those eventualities." nymag.com

There may not be a "methane bomb," but higher temperatures are already causing methane eruptions in the far North. A huge explosion was heard in June of this year in the Yamal Peninsula of Siberia in Russia. Reindeer herders saw flames shooting up with pillars of smoke and found a large crater in the ground where the flames had been. Melting permafrost is suspected, as has been the case with fourteen other giant craters that have been found in the region over the past three years—one estimated as 160 feet wide and 230 feet deep. There have also been instances of the ground trembling as bubbles of methane trapped below the surface set the ground wobbling. theguardian.com And plague? Thawing tundra is believed to explain the release last year of Anthrax spores that had remained dormant for 75 years, and were released from a thawing reindeer to infect an entire reindeer herd and thirteen human victims. livescience.com A study published July 19, 2017, in the journal *Scientific Reports*, suggests that these methane "seeps" on the tundra may be more problematic than previously thought. The study finds that 17 percent of methane emissions in a 10,000 square-kilometer swath of the Mackenzie River Delta in northwestern Canada came from the seeps, despite emissions hotspots covering only one percent of the tundra's surface. The peak concentrations of methane emissions were found to be 13 times higher than levels usually caused by bacterial decomposition—a well-known source of methane emissions from permafrost, which suggests the methane is likely also coming from geological sources. What is not yet clear is whether the rapid climate warming in the Arctic will lead to a massive surge in releases of methane. insideclimatenews.org

Sea ice in the Arctic is reported to be at its sixth-lowest extent for the month of June since measurements began. Unfortunately, sixth-lowest extent is not the improvement the number might seem to suggest. That's because sea ice extent is on par with 2012 as of July 2, 2017, and 2012 is the year that went on to set the mark for lowest Arctic sea ice minimum on record. That year in August a major storm churned the ocean so badly that ice broke up and melting increased accordingly. If such a thing were to happen in 2017, researchers say, the ice might not be able to recover. Sea ice is now missing from 348,000 square miles of the Arctic Ocean, an area about three times the size of Arizona. climatecentral.org

The breakup of Larsen C that took place in Antarctica on July 12, 2017, is not attributed to global warming, since the calving of icebergs from Antarctica is a common occurrence. Neither will it directly raise sea levels, since ice shelves and icebergs float on the sea. The event is part of a progression consistent with the direction of climate change and dramatic warming on the Peninsula since the 1950s, however, and as sections break off, the smaller sections of ice have more surface exposed to warming water and thus to faster melting. As Larsen C loses a shelf this large, too, there is increasing danger that the glaciers located there could reach the sea, since they would have less distance to travel. Large ice shelves serve as giant brakes that preventing glaciers from flowing directly into the ocean. If the glaciers held in check by Larsen C were to spill into the Antarctic Ocean, the global water mark would be lifted by about four inches, according to estimates. dailymail.co.uk

The city of Ahvaz in Iran registered a temperature of 128.7 degrees Fahrenheit (53.7°C) on June 29, 2017—the hottest temperature ever reliably measured by modern instruments. The heat in this city of 1.1 million people felt even more stifling due to high humidity. The dew point, a measure of humidity, peaked in the low 70s due to air flow from the Persian Gulf, unusual for the desert location. The combination of heat and humidity was so extreme that it was beyond levels the heat index was designed to compute. The index exceeded 140 degrees. Washington Post When the heat soared to 98 degrees in Los Angeles, CA, on July 8, 2017, it broke the record of 95 degrees set in 1886, 131 years ago. lacurbed.com The great southwestern heat wave of the week of June 18, 2017, saw long streaks of record-breaking temperatures: Las Vegas, NV, saw nine consecutive days of 110° readings; Prescott, AZ, hit 100° on six consecutive days; Redding, CA, had five consecutive days that broke the record high for the dates with a peak of 113° on June 19. Prolonged heat waves are especially hazardous because there is less chance for people who don't have access to air conditioning to cool down by night. weatherunderground.com

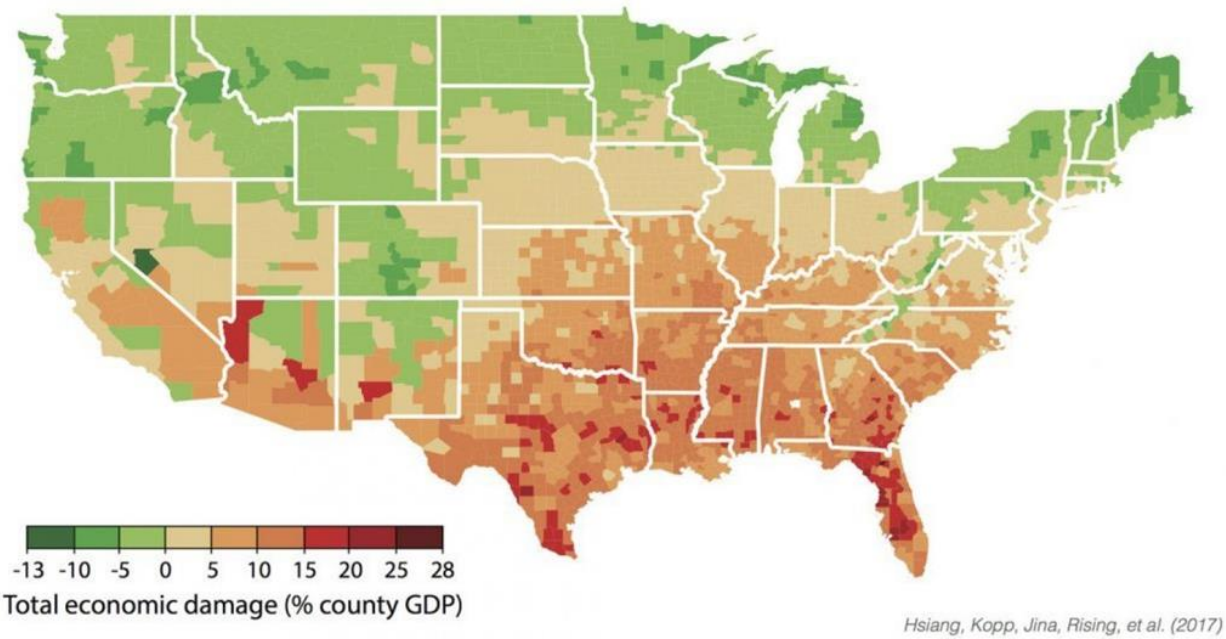
A list of 490 United States communities that will face flooding across at least 10 percent of their area every two weeks by 2100 was published by the Union of Concerned Scientists on July 12, 2017. The list, based on federal data, predicts the American cities and towns that can expect to become what it calls "chronically inundated" by rising sea levels under three scenarios: high (6.5 feet of sea level rise globally); intermediate (4 feet); and low (the scenario that assumes carbon emissions decline steeply and warming is limited to less than 2 degrees Celsius, in line with the primary goal of the Paris Climate Agreement). The report also contains

lists of communities that can expect that degree of inundation by 2035 and 2060 under each scenario. By 2035 the report concludes 170 communities will face flooding to the degree outlined; by 2060 the number rises to 270. The writers comment: “There comes a threshold of chronic flooding that makes normal routines impossible and forces communities to make difficult, often costly choices.” To see the list of cities impacted in your coastal state, download the Excel file “Complete data by state” on the report’s home page.

One-fifth of the world's population could become climate change refugees due to rising ocean levels by the year 2100 according to Cornell University researchers. Beyond sea level rise, low-elevation coastal zones in many countries face intensifying storm surges that will push sea water further inland as well, and the two billion people who live near coastlines will face displacement and resettlement bottlenecks as they seek habitable places inland. “We're going to have more people on less land and sooner that we think,” said lead author Charles Geisler, professor emeritus of development sociology at Cornell. “The future rise in global mean sea level probably won't be gradual. Yet few policy makers are taking stock of the significant barriers to entry that coastal climate refugees, like other refugees, will encounter when they migrate to higher ground.” The study appraises the “colliding forces of human fertility, submerging coastal zones, residential retreat, and impediments to inland resettlement,” and foresees land-use trade-offs and conflicts. In the United States and elsewhere, this could mean selling off public lands for human settlement. sciencedaily.com

Countries in Asia and the Pacific will face particularly severe impacts from climate change, according to a survey released July 13, 2017, from the Asian Development Bank. Under a business-as-usual scenario the region could see an increase in temperature of 6 degrees C by 2100, rising seas could displace as many as 130 million people, and changes in temperature and precipitation could cut rice yields by up to 50 percent in some of these countries. Marine ecosystems, particularly in the Western Pacific, will be in serious danger by 2100 due to coral bleaching, and heat-related deaths in the region among the elderly are expected to rise by about 52,000 cases by 2050. bloomberg.com

Worsened poverty in already-poor areas of the United States is yet another impact of climate change. We’ve always known climate change impacts will hurt the poor first and worst, but research published on June 29, 2017, in the journal Science have focused on the widening economic inequality among Americans. “You're going to see this transfer of wealth from the Southeast to the parts of the country that are less exposed to risk,” said study co-author Robert Kopp, a Rutgers University climate scientist. “On average both in this country and on this planet just poorer people are in hotter areas.” The county hit hardest if greenhouse gas emissions continue unabated is tiny and impoverished Union County in Florida, where median income would take a 28 percent hit. And among counties with at least 500,000 people, Polk County in central Florida would suffer the most, with loss of more than 17 percent of income. washingtonpost.com



Projected economic damage by county between 2080 and 2099 if the United States continues a "business-as-usual" approach to carbon dioxide emissions. (Hsiang, Kopp, Jina, Rising, et al.)

Climate kids will be in court on February 5, 2018, to take on the federal government. The date has been set for the first case to use a theory known as atmospheric trust law, which argues that the federal government, through actions like fossil fuel subsidies, has actively undermined the youth's right to a livable climate. Atmospheric trust law is based on an old legal doctrine that holds the federal government must preserve certainly commonly held elements, like shorelines and waterways, for public use. Applying public trust to the atmosphere, the plaintiffs argue that the government must also take steps to preserve the atmosphere from rampant greenhouse gas pollution. The trial will take place in Eugene, Oregon, before US District Court Judge Ann Aiken, the judge who in November ruled the plaintiffs could reasonably argue that they were likely to suffer personal damages if the United States did not take action to rein in carbon emissions. thinkprogress.org

The paper "Young Peoples' Burden," released July 18, 2017, provides the scientific underpinning for the legal case brought by these young people. The paper's lead author, Dr. James Hansen of Columbia University, is the grandfather of plaintiff Sophie Kivlehan."Our case focuses on putting the best available science in the courtroom to show how our youngest generation and future generations will be burdened by the continued high fossil fuel emissions," the plaintiffs' co-lead counsel Phillip Gregory said in the press call announcing the research. nexusmedianews.com

Lawmakers in California renewed the state's landmark cap-and-trade climate legislation on July 17, 2017, with eight Republican lawmakers voting in favor of the bill. Republican backing was much stronger than in the past, when major California climate policies never gained more than one or two votes from the minority party. Assemblyman Devon Mathis (R-Visalia) grew

emotional as he spoke on the floor. “We have to make decisions as legislators—do we do what is right or do we do what is politically right?" he asked. Securing Republican support involved a number of concessions, including rolling back a fire prevention tax levied on landowners largely in rural areas of the state, which has long been a target for repeal by the GOP, and extending a tax credit for manufacturers, which was broadened to include some power companies. The concessions to industry were troubling to environmentalists, but the new legislation will extend the world's second-largest carbon market to 2030, and is a major victory for climate champion Governor Jerry Brown. The legislation passed with a supermajority in both the Assembly and the Senate, insulating it from any possible legal challenges. latimes.com

What would happen if a one-sentence climate report were to be broadcast every hour on popular television networks instead of stock market numbers? (Idea submitted by a reader.)