

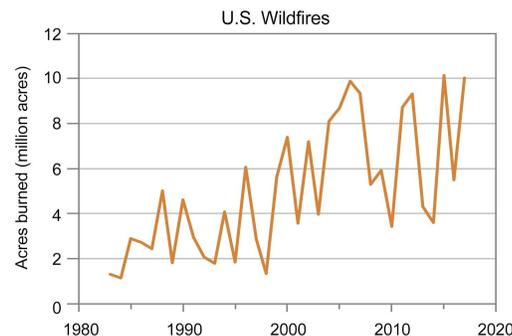
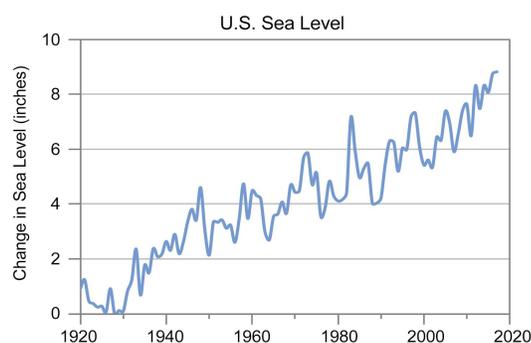
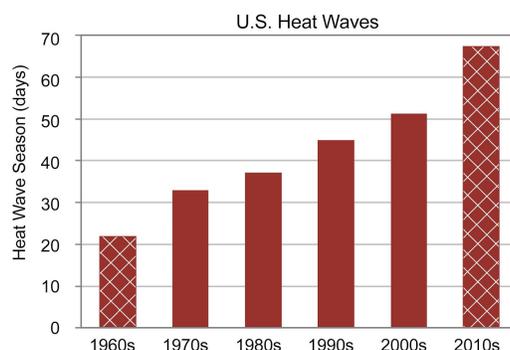


By Sam Matey

Climate Change. On November 23rd, the second volume of the 4th National Climate Assessment was released to the public. Its release on Black Friday prompted fears that the Trump Administration was attempting to bury the report by releasing it on a holiday, but it appears to have backfired, with the report getting heavy coverage across news sources. The new NCA report was assembled by the US Global Change Research Program, an interagency climate change research program contributed to by 13 federal agencies, led by the National Oceanic and Atmospheric Administration and including NASA and the NSF. It was written by 300 experts from climate-related fields.

The National Climate Assessment draws on decades' worth of data to create a report of breathtaking scope. Human emissions of greenhouse gases, and the resulting global warming, have created an array of interacting effects, and the report delves into a wide swath of them. A partial list of ongoing climate change impacts discussed in the report include warming temperatures (pictured, right: gridded bars indicate that complete data for that decade is unavailable), health effects of extreme heat waves, rising sea levels (pictured, right), the spread of vector-borne diseases, drought-driven beetle outbreaks that damage forests, increased wildfire risk and severity (pictured, right), shifting temperature and precipitation patterns harming agricultural yields, melting permafrost, more harmful algal blooms, air pollution from wildfire smoke and dust, the reduction of snowpacks vital to irrigation, bleaching coral reefs, large-scale shifts in species range (generally northwards or to a higher elevation, i.e. colder temperatures), and harmful economic impacts from all of the above.

In another focus, the report has 10 chapters giving detailed region-specific climate impacts, for America's Northeast, Northern Great Plains, Alaska, US Caribbean, and so on. The report also discussed two new tools created by NOAA in recent years: state-level summaries of climate impacts at statesummaries.ncics.org and the US Climate Resilience Toolkit at toolkit.climate.gov. Check them out!





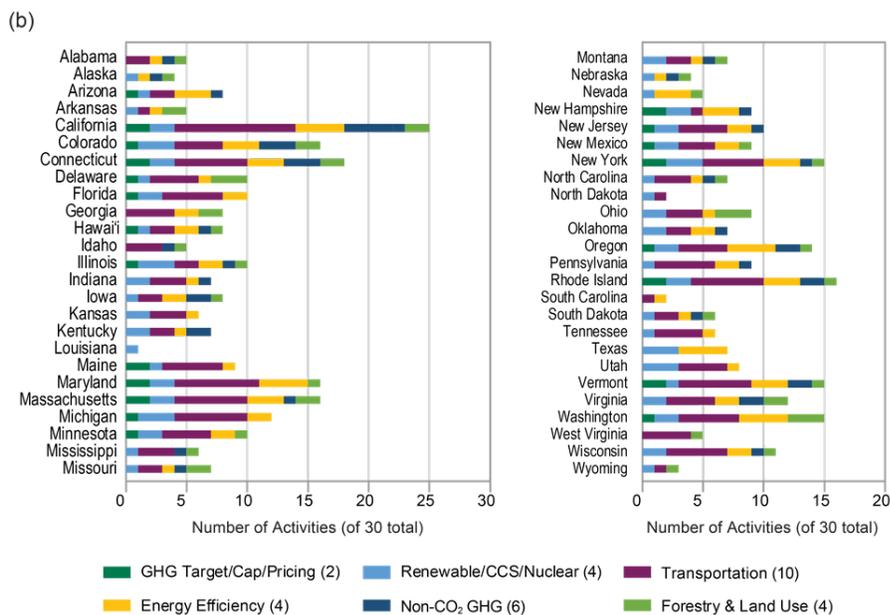
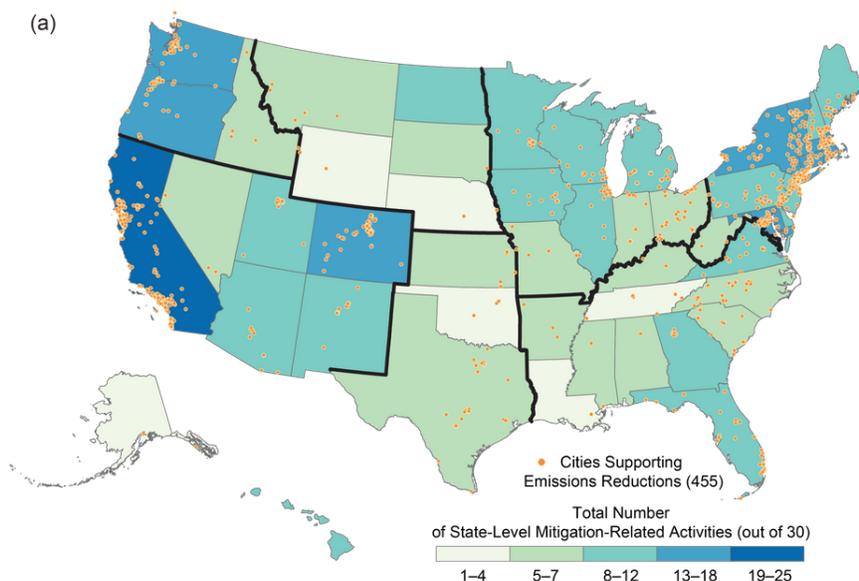
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By Sam Matey

The report urges adaptation to the world's changing climate and continued emissions reduction to minimize damage. Some positive news from the report was the discussion of how many states and cities are already working to reduce their emissions (see map and graph, right), as well as a number of coastal cities taking action to protect themselves from rising sea levels. The report noted that cities, tribes, and states across the nation were prioritizing a shift to renewable energy, and market forces were further driving a gradual decline in American greenhouse gas emissions. Although renewable energy, in the US and the world, is still not growing fast enough to avert higher-emissions scenarios, it's growing much faster than expected in the early 21st century, raising hopes for even more technological transformation in the future. (For more on this issue, check out the International Energy Agency's World Energy Outlook 2018 at www.iea.org/weo2018/.)



Furthermore, cities and towns, are taking the lead in adapting to climate change. To take a few examples in the field of sea level rise alone, New York City has moved some houses out of high-flood zones, raised the height of some buildings, and worked to incorporate new flood risk estimates into building code and land use policy. Norfolk, Virginia, home to the world's largest naval base, is investing in erosion control and street flooding mitigation and requires all new



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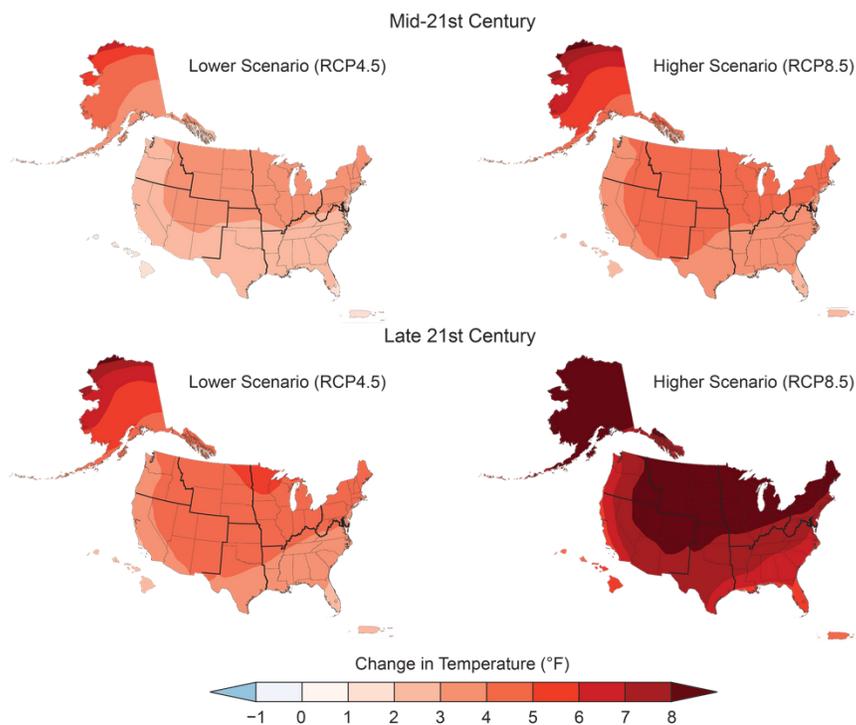
structures to have a “freeboard” elevating it three feet above mapped flood elevation. A federal grant is being used to relocate the people of Isle de Jean Charles, Louisiana, to higher ground. And the Alaska Native Village of Kivalina is now protected by a new rock wall that should shield it from erosion for the next 15 to 20



years, until they can finalize relocation plans. (Pictured above: Isle de Jean Charles on the left, Kivalina on the right). These communities are all working to take control of their futures and ensure that their families’ homes will survive the Anthropocene.

As a side note, the 4th NCA wasn’t the only climate report that came out on November 23rd. In an underreported story, a new USGS found that the burning of fossil fuels extracted from public lands had contributed, on average, 23.7 percent of national CO2 emissions between 2005 and 2014. This indicates that a new pro-climate action federal government could substantially reduce American emissions through public lands-protecting executive action. (Check out this report at pubs.usgs.gov/sir/2018/5131/sir20185131.pdf).

In sum, arguably the most important takeaway from the 4th NCA report is that while climate change is happening now and that some aspects are unavoidable, we can work to adapt to these changes and our energy choices in the next few decades will still have an immense impact on the future of the nation and the world. (Pictured, at right, are projected changes in temperature under low- and high-emissions scenarios). America’s future in the Anthropocene will be shaped not by some future generation, but by us, here and now.



All figures in this story are from the 4th National Climate Assessment. Read the full assessment at nca2018.globalchange.gov/.