

Looking Back – Looking Ahead



Rising sea levels. Image: the conversation.com

By Dr. Alan K. Betts

This is the time to look back on 2018 and reflect on what we have seen, and what we have learned. At the same time, the climate endgame is getting closer, so we must face reality. As greenhouse gases reduce the cooling of the earth to space, more and more heat is stored in the oceans, and warming oceans make tropical storms, hurricanes and typhoons more powerful and dangerous.

In 2017, hurricanes Harvey, Irma and Maria struck Texas, Florida, the Caribbean and Puerto Rico. Harvey stayed over the Houston region for four days and dumped over three feet of rain, giving catastrophic flooding, because very little rain can soak into the ground in an urban area. In 2018, tropical storms Lane and Olivia brought very heavy rain to Hawaii. Then hurricane Florence stalled for three days in mid-September on the North Carolina coast giving severe flooding from both the storm surge and twenty-five inches of rain. On October 10th, hurricane Michael intensified very rapidly just before it made landfall on the Florida panhandle as a category four storm, creating immense damage that stretched inland into Georgia. Rebuilding costs will be massive. In the western Pacific this year, there were six category five typhoons. The most powerful storm of the year, super-Typhoon Yutu, devastated the U.S. territory of the Northern Marianas Islands in late October, but little news reached the mainland.

For readers in the Northeast, these tropical storms are far away. Closer to home, it has been a year of different extremes. As the Arctic warms faster than the tropical regions, mid-latitude weather patterns are generally slowing down with larger amplitude waves in the jet-stream. This gives alternating extremes around the globe. In April, there was record cold in north-central U.S., which stretched up into Canada. This was followed by the six months, May to October, which set high temperature records in the east with record precipitation from Virginia to Pennsylvania. High temperatures and drought in the western U.S. led to severe fires in November in California that set new records for loss of life and property – beating the staggering losses in 2017.

The most recent IPCC report is very blunt and very thorough, saying we have just twelve years to drastically reduce fossil fuel emissions or the damage to life on Earth will be increasingly severe as decades pass. Over Thanksgiving, the U.S. Global Change Research Program released the 2018 National Climate Assessment: a lengthy synthesis by three hundred scientists. This forecasts a century of increasing devastation from climate change to the U.S. economy, agriculture, infrastructure; coastal city flooding from a four-foot rise in relative sea level, and a cascade of deadly events from hurricanes to forest fires to drought. The chapter for the Northeast will be useful to readers (<https://nca2018.globalchange.gov/chapter/18/>).

In earlier days, government reports like this would be a wake-up call, since we can see what is happening both here and around the globe. But today, the U.S. federal government is simply ignoring reality and denying climate change is happening. The president recently blamed California's tragic fires on forest management ("they should rake the forest floor"). Asked about the National Climate Assessment, he said he didn't "believe" the scientists that wrote it. His falsehoods (<https://www.factcheck.org/person/donald-trump/>), are presumably to protect the interests of his fossil fuel sponsors. Yet in a parallel universe, his application to raise the sea-wall to protect his Irish golf course from rising sea level cites the dangers of climate change.

Back in 2012, North Carolina legislators passed an astonishing bill that barred policymakers and developers from using up-to-date climate science to plan for rising sea levels on the state's coast. This was because updated flood zones would restrict development and reduce property values. The climate system paid no attention. The storm surge and twenty-five inches of rain from hurricane Florence

simply drowned the stupidity of the North Carolina legislators, causing immense damage.

Readers need no reminder that living in fantasies is rarely good for business, so keep seeking the best technical guidance. As the oceans warm and the melting Arctic tundra releases methane, the Earth system is moving towards instability, which makes planning for the future a challenge. We must speak up in our local communities and invest in local resilience for the long-term.

Dr. Alan Betts of Atmospheric Research in Pittsford, Vermont is a leading climate scientist. Browse alanbetts.com.

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