

Council Requests for Additional Information from the Administration on TAO1-FY19:

1. *Regarding the "Nationwide Trends" map from NOAA, please provide additional detail about the information reflected in the map -- timeframe, specific data points used, etc.*

As described in the following weblink, the map appeared in chapter 2 of the 2014 report, 'Climate Change Impacts in the United States: The Third National Climate Assessment Report.' The figure and data it uses is updated from the 2009 'Global Climate Change Impacts in the United States,' editors of which were NOAA and the Marine Biological Laboratory. More information about the map and the data can be found through this link (and the sub-links within):

<https://data.globalchange.gov/report/nca3/chapter/our-changing-climate/figure/observed-change-in-very-heavy-precipitation-2>

2. *Also, regarding the "Nationwide Trends" map from NOAA, please provide an updated map if possible. (Map shown was only through 2012.)*

The map provided is the most recent from the source described in the response to question #1.

3. *Please provide a copy of the article focused specifically on eastern seaboard weather trends which Mr. Weinstein mentioned during the discussion of the "Nationwide Trends" map.*

Please find attached a file with the Washington Post article that was referred to by Mr. Weinstein during the discussion of the "Nationwide Trends" map.

4. *Please provide an adjusted version of the "Full Plan Model" map to indicate the depth of water exceeding the channel.*

We believe the Council is asking if there is a way to measure the water over and above the water that would be in the channel. This is what the model maps are showing – that once the water breaches the channel, it spills out and the colored areas of the map (any areas that are not a channel) reflect the level of water that might exceed the depth of the water in the channel. This can likely be more easily described visually during the work session.

7. *Please provide a summary of the real estate deals proposed with as much detail as can be made public.*

There are no real estate deals to date. The Council will need to provide funding authority before any real estate deals can occur.

11. How does the Flood Mitigation Plan align with the EC Master Plan to move EC forward as a vibrant, attractive, and exciting destination?

The Ellicott City Master Plan was nearing its final phase – the delivery of a final draft plan - when the May 27, 2018 flood occurred. The draft master plan vision, which remains relevant, stated: *“Ellicott City and its watershed is a model, resilient community that thrives by protecting its people, commerce, history, culture and natural environment.”*

Prior to May 27, 2018, the master plan process included the presentation of several draft concepts to the community. Originally, master plan concepts would be recommended as near, medium or longer-term projects. These concepts included a major flood conveyance improvement called “Hudson Bend,” a daylit, widened, terraced stream channel spanning from Court Avenue through Lot D. As many other communities have found, widened stream channels can be designed to function not only as flood mitigation but also as major amenity features – with landscaping, hardscaping and inviting open space.

To accommodate the space required for the widened stream channel, this master plan concept included the removal of the portion of the building housing La Palapa and removal and potential relocation of the Ellicott Mills Brewing outbuilding. Both of those buildings span the stream channel and would require removal for the stream channel widening to proceed.

Following the May 2018 flood, a priority was to develop an accelerated concept for flood mitigation. The five-year flood mitigation plan is the result, which now includes the Hudson Bend concept and the concept of a widened stream channel has been extended from Ellicott Mills Drive to Maryland Avenue. The master plan will provide guidance on how the widened channel can be terraced and designed to serve as a major amenity, similar to that envisioned for Hudson Bend. The five-year flood mitigation plan will serve as the near-term action plan and nest within the longer-term master plan.

14. Please provide a copy of the presentation and any materials to be provided at the September 12 Master Plan public information meeting.

The September 12, 2018 Ellicott City Watershed Master Plan meeting presentation and video are posted on the EC Master Plan webpage: www.howardcountymd.gov/ECMP.

A direct link to the powerpoint can be found here:

<https://www.howardcountymd.gov/LinkClick.aspx?fileticket=lx-y592IJA%3d&portalid=0>

National

Immense rains are causing more flash flooding, and experts say it's getting worse

By [Tim Craig](#) and
[Angela Fritz](#)

June 24

OLD FORT, N.C. — Brian Gentry was certain his 33,000-pound truck would be fine as he headed out into the heavy rains here in the Blue Ridge Mountains. But as he went to clear debris from a two-lane highway after more than a half-foot of rain, rocklike drops pounded the windows, and he heard the earth “crack” around him as the land began to slide.

Mud and uprooted trees slammed his vehicle, tossing it across the highway, over a 10-foot embankment and into the raging Catawba River. Gentry and a co-worker with the North Carolina Department of Transportation were rolled, and the truck came to rest in the water, just the passenger-side window peeking out.

“I looked around, and I saw everything that was going on, and I thought, ‘I am going to die,’” Gentry, 47, recalled. “I thought, ‘My life is about over, so I need to call my wife.’”

Gentry spent 40 minutes clinging to a rope in the water awaiting rescue, the victim of an alarming phenomenon: Torrential rain events across the United States are becoming more frequent and more intense, leading to record rainfall, rare extreme flooding and perilous infrastructure failures.

Experts say the immense rains — some spawned by tropical ocean waters, others by once-routine thunderstorms — are the product of long-rising air temperatures and an increase in the sheer size of the storms. Because warmer air can hold more water, large storms are dropping far more rain at a faster clip.

Such rains in recent weeks have deluged the Great Lakes region, the Deep South and the suburbs of major cities along the Atlantic coast. Philadelphia, Charlottesville, and Ocean City, [Ellicott City](#) and Frederick in Maryland all have experienced major flooding since mid-May. Several locations in Maryland had their wettest May on record, including Baltimore, which tallied more than eight inches, most of which fell in the second half of the month.

“Things are definitely getting more extreme,” said Andreas Prein, an atmospheric scientist at the National Center for Atmospheric Research in Boulder, Colo. “You just have to look at the records. All areas of the continental U.S. have seen increases in peak rainfall rates in the past 50 years. . . . And there is a chance that we are underestimating the risk, actually.”

On Friday, Richmond experienced its second-wettest day on record — 7.61 inches of rain, more than the city typically gets in the entire month of June, topping the previous record on Aug. 12, 1955, during Hurricane Connie. The torrential rains in the past week flooded Richmond International Airport, which closed its doors for more than two hours Friday.

Slow-moving thunderstorms on Wednesday triggered widespread flooding in suburban Pittsburgh, where residents posted online videos showing cars, television sets and dumpsters floating down streets and highways. Rainfall rates reached two to three inches per hour during that storm, according to the National Weather Service in Pittsburgh.

Several stalled storms last weekend resulted in catastrophic flooding of homes and businesses on the Upper Peninsula of Michigan, prompting Gov. Rick Snyder (R) to declare a state of disaster in the counties affected. In South Texas, days of heavy rain inundated subdivisions with several feet of water, and the Texas National Guard used helicopters to rescue stranded residents.

And in North Carolina, the May 29 flooding in McDowell County resulted in 18 people needing rescue, including the highway workers in Old Fort. As the runoff poured into mountain streams, officials ordered up to 2,000 residents to evacuate amid fears that the Lake Tahoma Dam could fail. There were also more than 40 landslides, which the McDowell County Office of Emergency Management described as unprecedented.

“The storms are worse. The rain is worse. The heat is worse,” said Melissa Smith, an Old Fort resident, after a mountain stream overflowed that night and spilled several feet of mud, rocks and other debris into her yard. “Everything is worse.”

Several atmospheric researchers said in interviews that they agree with that perception. They say it is getting worse.

Since 1880, global temperature has risen just more than 0.13 degrees per decade, for a total of 1.8 degrees Fahrenheit (1 degree Celsius). The amount of water air can hold is based on temperature — put very simply, the warmer the air is, the more water it can hold.

Theoretically, experts say, an additional 1.8 degrees would amount to about 7 percent more water in the air, resulting in a similar increase in extreme rainfall. But what Prein and other researchers have found is much higher across a vast portion of the United States.

According to the 2014 National Climate Assessment, the eastern half of the continental United States has seen the most dramatic change in extreme rainfall. The amount of rain during the most extreme storms in the Northeast has risen 71 percent since 1958; in the Midwest, heavy rain has increased 37 percent; in the Southeast, it's up 27 percent.

And the area covered by each storm also is getting larger, Prein said, another major factor in the increased precipitation. Prein's new research suggests thunderstorms will become 80 to 90 percent larger by the end of the century.

The heavy rain and the larger storms explain why the country has seen an increase in dangerous flash flooding like Old Fort saw three weeks ago.

The 900 residents who live here note that their town has been built around a culture of resiliency, living with the threat of flooding since its origins as a westernmost outpost in colonial America. It was named after the European settlers' forts constructed in the mid-1700s to ward off Native American tribes.

In 1916, after the remnants of two tropical systems merged over the area, floodwater inundated much of the community, washing away what was left of the town's original forts, said Carol Price, executive director of the McDowell Tourism Development Authority. The area also experienced a major flood following thunderstorms in 1977, and again in 2004, as the remains of Hurricane Ivan passed through.

But Price said the rainstorm last month appeared to easily surpass both of those floods. The waters of Mill Creek, a mountain stream that flows from the Eastern Continental Divide into the Catawba River, for the first time overtopped a retaining wall that had been built in the 1930s under President Franklin D. Roosevelt's Civilian Conservation Corps, Price said.

About 15 miles away, officials worried that a nearly 100-year-old dam could fail, prompting the mass evacuation downstream along Buck Creek. The alert was triggered after more than two feet of water began flowing over the top of the dam. A landslide near its base worried engineers, who thought the integrity of the structure had been compromised.

At the historic Carson House, which was the estate of one of McDowell County's founders, Col. John Carson, museum officials were warned a 30-foot wall of water could topple the property if the dam failed. Amanda Finn, the museum's executive director, began rushing to remove historical artifacts, including a walking stick that President Andrew Jackson had given Carson.

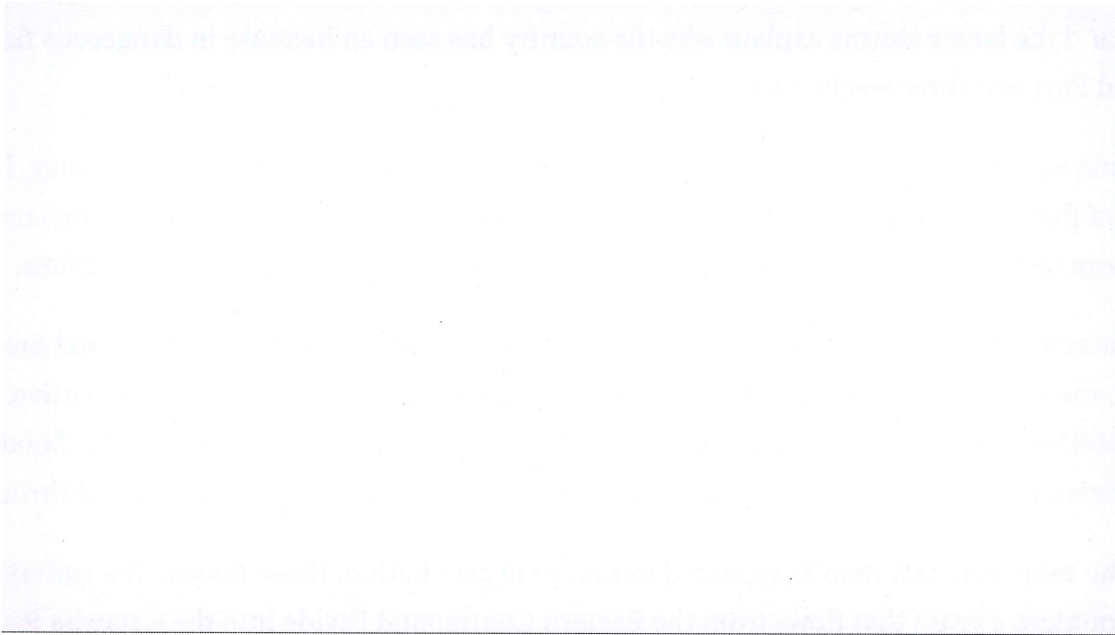
Officials signaled the all-clear a few hours later, after they inspected the dam in the daylight, but Finn said Buck Creek still breached its banks, causing water to lap up to the foundation of the house.

"When it reached its highest point, we were very concerned," Finn said, noting there wasn't much else they could do to protect the historic home.

The rising waters caused similar concern for the residents of Ellicott City on May 27, when [the town's streets were turned into a raging river for the second time in two years](#), sending people scurrying to second and third floors. Cars rode the waves on Main Street, and historic buildings were swept from their foundations.

The 2016 and 2018 floods both were caused by 1-in-1,000-year storms, meaning the odds are shifting, perplexing meteorologists such as Greg Carbin at the National Weather Service in College Park, Md.

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“There’s something that bothers me about that,” Carbin said. “What are the chances that would happen twice within two years in Ellicott City?”

In western North Carolina, a deeply conservative region, most residents say they, too, now believe weather patterns are changing. But here in the “Blue Ridge Bible Belt,” many say God — not man-made climate change — is to blame for the more extreme weather.

On Catawba River Road, which connects Old Fort to the 500,000-acre Pisgah National Forest, 80-year-old Leslie Allison lost part of his cow pasture in the May storm. But Allison and his wife, Virginia, 65, viewed the loss as a sign that God is dissatisfied with modern-day American values.

“You know what the problem is,” said Leslie Allison, a devout Christian who repeatedly volunteered that he is a supporter of President Trump. “This country has turned away from God, and he is going to bring judgment to this country.”


Dan Watson and his wife, Ann, manage Buck Creek R.V. Park, which is located about three miles downstream from the Lake Tahoma Dam. Ann Watson said her Baptist faith teaches her that the extreme weather is a sign Jesus will soon return to Earth, and she doesn’t believe climate-change science. But Dan Watson said he believes man could be partly responsible for the shift in weather.

“I’m not going to be the one that sits down and does things differently in my activity because I’m worried about the Earth,” Dan Watson said. “But do I think there could be some global warming? Yes.”

Gentry, the North Carolina transportation worker whose truck was swamped in the May flooding, said he hopes residents here stay focused on the more immediate challenge: It's only a matter of time before the next dangerous flash flood occurs in these mountains.

"Water runs downhill; you got small valleys, and it rises quickly, and that is normal," said Gentry, who is also the head of the McDowell County Volunteer Department's rescue squad. "I am sure going to have my ear attuned to try to hear an earlier crack."

**Tim Craig**

Tim Craig is a national reporter on the America desk. He previously served as head of The Washington Post's Afghanistan-Pakistan bureau, based in Islamabad and Kabul. He has also reported from Iraq, the District and Baltimore. Follow 

**Angela Fritz**

Angela Fritz is an atmospheric scientist and The Washington Post's deputy weather editor. Before joining The Post, Fritz worked as a meteorologist at CNN in Atlanta and Weather Underground in San Francisco. She has a BS in meteorology and an MS in earth and atmospheric science. Follow 