

MINUTES

Baltimore County Advisory Commission on Environmental Quality (CEQ)

October 26, 2022

7 – 8:30 PM

Online Meeting on Webex

CEQ meeting dates, membership information, and reports are available at www.baltimorecountymd.gov/Agencies/ceq/index.html

Our thanks to Brian Lindley of DEPS for coordinating Webex meetings.

Attendance: Brian Lindley, Carol Newill, Andy Miller, Justin Gallardo, Joan Plisko, Chris Overcash, Brian Bernstein, Lois Jacobs, Henry Ayakwah, Steve Malan, Valerie Androutsopoulos, and John Lee from WYPR

Excused: Karen Wynn, Lynda Eisenberg, Brian Fath, Lynda Eisenberg, Mahnaz Assadi

7 pm

I. Welcome – Carol Newill, Chair

Introduction of Speaker, Andy Miller, PHD, UMBC Professor of Geography & Environmental Systems, recent Chair of the Chesapeake Bay Program Scientific and Technical Advisory Committee, and CEQ member. This meeting is being recorded so the presentation will be available.

7:08 pm

II. Is Climate Change Causing More Frequent Intense Rainfall and Flooding?

How Is Our Understanding Changing As We Get the Data?

Let's start with Ellicott City, MD what we do and don't understand. We know these are extreme events, but how extreme? The flood peaks estimated by USGS in the Tiber River tributaries in Ellicott City are larger than peak flows we have seen in watersheds of comparable size anywhere in the mid-Atlantic region. Although they have been described as 1000-year events it seems likely that they are not so rare as described. The probability of having 1000-year floods occur in two years out of three in the same watersheds is 3 in a million. That is not physically impossible, but if climate change is causing extreme rainfall to happen more often than it did in the past, those probabilities may no longer be reliable.

We need to change the assessments. NOAA Atlas 14 is the standard source for assessing probabilities of extreme rainfall but it is generally accepted that those probabilities need to be updated. Two recent approaches that have been developed for use in our region are designed to predict future probabilities based on downscaling of global climate models. A presentation by Jon Butcher of Tetra Tech in June 2022 predicted ~14%

increase in storm peak runoff rates by the late 21st century. A paper documenting his work was published in 2021 in the Journal of Water Resources Planning and Management. A similar approach by a consortium of researchers from the RAND Corporation, Cornell, and Carnegie-Mellon has produced a [web-based tool for use in the Chesapeake Bay watershed](#) by applying correction factors to the predicted values in Atlas 14.

A 22-year (2000-2021) record of radar rainfall estimates covering the Baltimore metropolitan region over an area of 4900 km² has been produced by James Smith and Mary Lynn Baeck of Princeton University for the months of April–September when intense convective rainfall is most likely to occur. The radar estimates were bias-corrected using data from rain gages from Baltimore County, Baltimore City, and the surrounding area. The first decade of results were described in a paper published in Water Resources Research in 2012. That paper illustrated spatial patterns in rainfall that were not previously known; for example, areas northeast of Baltimore City had up to 100% higher average July rainfall than areas in western Howard County.

Our metropolitan region has some of the flashiest small urban watersheds in the continental U.S. Many of the biggest floods in these watersheds are associated with rainfall periods between 30 minutes and 3 hours, whereas most of the data on which Atlas 14 is based comes from daily rainfall totals that have been used to estimate probabilities for shorter time scales. The radar rainfall data has much higher spatial resolution and provides data for shorter rain periods than the data used to compile Atlas 14.

The radar rainfall data are being used to look at spatial patterns in rainfall in our area and are being analyzed using nonstationary probability approaches to quantify trends over time in the data and to calculate changes between 2000 and 2021 in the amount of rainfall predicted to occur with frequencies of 1-, 2-, 5-, 10-, 25-, 50- and 100-years for a variety of durations. These estimates may help improve our understanding of what causes trends over time in watershed response to rainfall events.

The mapped distribution of predicted 60-minute, 100-year rainfall shows much stronger patterns of spatial variation over short distances by comparison with Atlas 14. The spatial patterns of intense rainfall are very similar to mapped spatial patterns showing the frequency of lightning strikes.

The ratio of the predicted rainfall depths for 1-hour 100-year rainfall from 2000-2021 includes some locations showing a decrease, but the vast majority of locations showing increases over time with a median increase of 10-15% and some locations have increases of as much as 30%. For shorter return periods the median increases over some of our small watersheds may be as much as 20% or more. This is still work in progress

and more analysis is needed to make improved estimates of how the frequency and magnitude of extreme rainfall is changing.

Questions/Comments:

Justin: Lots of blame is placed on over-development, which is almost always resolved politically.

Andy: Development definitely has exacerbated the problem, but let's remember that Ellicott City is a mill town in a narrow, steep valley where there was always significant risk of flooding. The Tiber and its tributaries literally flow underneath buildings and roads and there is no place for the water to go in a big storm.

Joan: What recommendations/advice do you have? What should we be doing that we're not doing?

Andy: Many local, state and federal agencies as well as academic scientists are thinking about this question. One local group known informally as the Baltimore flood team has run workshops to encourage discussion of the gaps between our changing understanding of the science and the regulatory frameworks that need to be revised in order to better meet the challenge. Baltimore County is an active partner in this ongoing discussion. There are also environmental justice considerations. Ellicott City got a lot of attention and a lot of funding in the aftermath of the two Ellicott City floods, but there are underserved communities in the Maiden Choice watershed that suffered serious losses but got less attention and less funding. When we talk about managing flood hazards we also have to be aware that many of our watersheds cross political boundaries, and management of hazards in inter-jurisdictional watersheds can be especially tricky.

Why is there so much runoff in developed areas? Because we have lost a lot of the moisture storage capacity of natural soils. Traditional storm water measures aren't effective enough to compensate for those changes.

Carol: Minebank Run and Cromwell Valley Park are affected by development and impervious surfaces up the hill across Cromwell Bridge Rd especially. West branch of the Herring Run is piped from downtown Towson to Burke Ave where it comes out as a very rapid stream alongside Radebaugh Park; at the park, a bioswale, a meadow and native grasses areas have been installed on the hillside that drains into the stream there.

Justin: In 2019, I worked on a Rain Garden on Cub Hill Rd. which helped. Rain gardens are ok, but what range are they good for?

Steve: Retention ponds are only OK. There's a big debate about them. Is there more runoff or no change?

Andy: Rain gardens and stormwater detention basins are capable of managing local runoff from moderately intense storms but are not as effective in controlling runoff from the kinds of storms that cause big floods. Some designs are better than others. They are ubiquitous in the landscape but they are designed to control runoff from specific sites and aren't necessarily designed in a way that considers the watershed as a whole.

Chris: What do you think about the direction in which we're moving? And what happens when flooding is compounded by storm surges?

Andy: I haven't studied coastal flooding and storm surges myself but the biggest long-term flooding problem in our region is probably the one caused by rising sea-level inundating low-lying areas along our coastlines. Many of our wetlands may be lost; in some places forests close to sea level are retreating at rates of up to 30 feet per year and farmland is being affected. Storm surge on top of rising sea level will cause much more damage over time and this is an issue of major concern.

NOTE: In this year's series of presentations on extreme weather and water-related challenges in Baltimore County, Chris Overcash has volunteered to speak 1/25/23 on his area of expertise, Coastal Flooding. Steve Malan will arrange for a speaker from the Agriculture field, and in the spring, County Sustainability Officer Jenn Aisoa will speak on aspects of flood control.

III. Approval of the Minutes for 5/25/22 & 9/28/22: No corrections; minutes approved.

IV: Current Efforts to Ban Plastic Bags at Grocery Stores

Councilmen David Marks & Todd Crandall don't need any additional information at this time and it's on hold until January 2023.

V: DEPS has not posted the two May 2022 reports to the webpage (as of 10/18/22)

Carol called David Lykens and has not received a return call. This is the only instance where CEQ reports have not been published. We should invite him to speak to the CEQ and Lois suggested we keep pushing to get an answer.

VI. Oregon Ridge Master Plan Process

Over 100 people attended the virtual and in-person meetings on 10/6 & 10/8. A public survey to collect feedback is open through 10/31/22 and has already received over 200 responses. The next public meetings on proposed enhancements to the park will be

11/12 (1 pm at the park's Nature Center) and 11/16 (virtual). Brian Bernstein attended as a representative for Trout Unlimited, Mid-Atlantic.

VII: Closing Comments: Carol requested that the Commissioners please vote on the 2021 Annual Report by 11/1/22.

8:15 Meeting Adjourned

Lois motioned, Brian seconded, none opposed.