

waterfrontline

The water's edge is the front line.

Black Earth, Wisconsin. 2018.

\$154 million damage across Dane County. 1600 homes & businesses impacted.

BEFORE:

The Shoe Box.

As you round a corner on Highway 14 in the center of Wisconsin, heading west between the towns of Black Earth and Mazomanie, suddenly on your left is a big box of a store. It's topped by a figure of King Kong grasping an airplane. On its side is a large St Louis Cardinals logo. (*photo by the author, 2017*)

The whole thing seems out of place. It's 400 miles from St Louis. It's almost exactly in the middle between the Mississippi River (about a two hour drive west) and Lake Michigan (two hours east).

It's the midwest's largest shoe store.



STEP INTO GOOGLE STREET VIEW:

By virtue of Google Street View, we can see exactly what this area looked like a month before floods struck. In July of 2018, Google Street View captured photos from the highway bridge about 100 yards west of the store.

To drop into the place, go here and spin around in place:

<https://www.google.com/maps/@43.1433447,-89.7497822,3a,75y,172.06h,90t/data=!3m6!1e1!3m4!1sL08sAQ7BrNgADHo9lqAu5g!2e0!7i13312!8i6656>

From that position, you are standing on Highway 14, initially facing southeast. Note the landmarks here — The Shoe Box at the eastern edge of the view, and the red trestle crossing the Black Earth Creek that is flowing beneath the bridge you are standing on. In the distance, between the trees, a brown-roofed house is visible. The distant trees and the trestle bridge's bottom edge are reflected on the still water.

To preserve them, here are screen shots from the July 2018 Google Street View, starting with a view showing The Shoe Box, the creek, and the red trestle bridge. The highway you're standing on is a critical access path to the town, and the store is the biggest thing there (*all images copyright Google street view*).



Turning slightly clockwise and look west along the road, you'll see the sign for nearby towns (Mazomanie is 4 miles away, Spring Green is 18):



Another quarter turn, you can see the upstream portion of the creek in a wide valley. Every part of these 3 pictures is about to look very different:



THE WARNING SHOT

Six years before those photos were taken, the US Geological Survey issued a report entitled “Watershed Scale Response to Climate Change—Black Earth Creek Basin, Wisconsin” (https://pubs.usgs.gov/fs/2011/3129/FS11-3129_508.pdf). The 2012 study was part of a program begun in 2008 “...to provide the foundation for hydrologically based climate-change studies across the nation.”

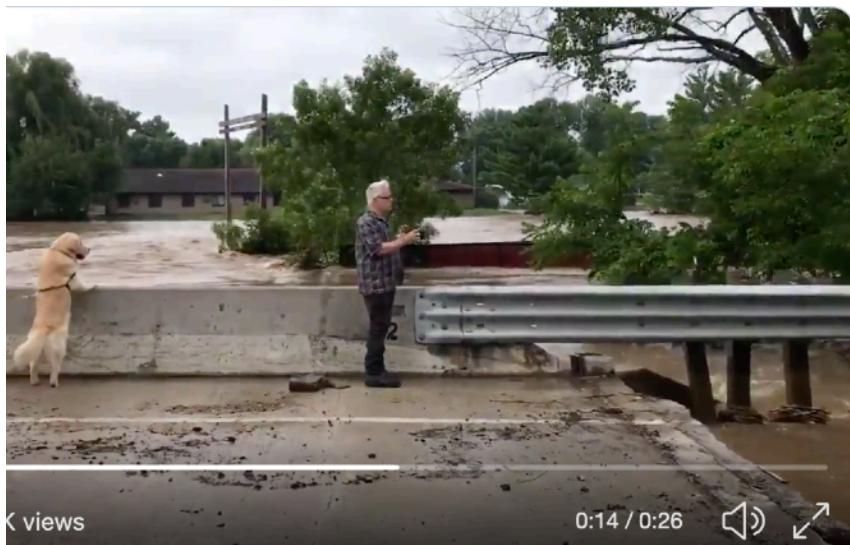
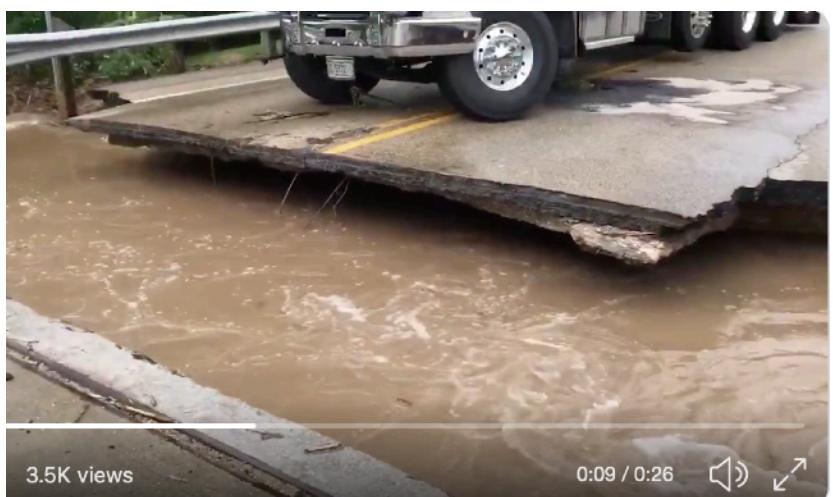
Specifically for Black Earth Creek, a popular destination for trout fishing, the report noted that regardless of the population model used, the area was expected to get drier over time (due to rising temperatures) and that a drier root zone would lead to increased water extraction from the creek to water crops. As winters became warmer, there would be a smaller snowpack for the area and the streams would change in both the timing and sources of their water:

“Thus, the characterization of upper-midwestern streams as being spring snowmelt-dominated may not hold if these emission scenarios of climate change are representative of future conditions. Rather, the hydrology would closer resemble more southerly United States streams.”

There are several impacts of such a transformation — to species that rely on the water temperatures for mating in specific seasons, to the other species in their ecosystem, and to the ability of the existing creekbed structures to channel water that comes in torrents of storms instead of steady snowpack melts.

AFTER

One month after the Google Street View photos were taken, the rains came. August 20 & 21 of 2018 brought record rainfall, with a reconfiguration of the area. This Twitter video starts with the northern side of the bridge (the first rock retaining wall can't be seen anymore) and ends facing the red trestle (stills from Twitter shown below). The highway bridge is wrecked. Look for the change to the upstream area and the red trestle bridge for before/after contrast.
<https://twitter.com/JoshSpreiterTV/status/1031906357870571520?s=20>



DESTRUCTION AND RECOVERY

The center pier of the highway bridge gave way and dropped into the creek from the force of the water and debris thrown against it. The engineers performing the reconstruction (<https://www.oesllc.com/portfolio-items/black-earth-bridge-reconstruction-dane-county-wi/>) reported a washout behind the abutment and a 15-foot scour in the underlying soil. Both rebuilt bridges were out for 3 months, reopening in November (<https://www.channel3000.com/news/hwy-14-bridges-main-access-points-into-black-earth-reopen/869680652>)

The flood exposed gas mains that ran parallel to each bridge, made vulnerable by the scouring of the soil. Those lines had to be carefully worked around until they could be taken out of service. The towns were dealing not only with the sudden physical isolation and loss of business, but also the interruptions to utilities that come with living on a virtual island.

The Shoe Box took on water and held sales for damaged stock. (see https://madison.com/wsj/business/black-earth-s-shoe-box-back-in-business-after-first/article_6b197a72-f73b-5b04-9446-8eaa036e8554.html)

Local broadcasts on the recovery (<https://youtu.be/z141pQT7fKI>) (screen shot below) highlighted the community efforts to reclaim and rebuild.



For a gallery of photos — damaged child care facilities, gas stations, homes, cars, and more, see https://madison.com/wsj/weather/photos-see-the-aftermath-of-severe-flooding-in-dane-county/collection_64f03fe1-62f8-5673-9705-7c3b7cb0bd09.html#6.

For a drone view of the flood's impact in the next town over, Mazomanie, see https://youtu.be/CHIVa_VKc9o (video by Edge Consulting Engineers) (screen shot below). And this was the town 4 miles away.



Dane County has taken steps to address immediate issues — including getting the sheriff's department an air-boat, and improving temporary flood boundary measures — as well as strategic concerns (see https://madison.com/wsj/news/local/environment/another-deluge-like-would-bring-deep-trouble-to-area/article_4fbbfcc2-e1c2-5294-b3ba-9fa3e117833a.html).

Most notably, a 160-acre Acker Farm next to the Pheasant Branch Conservancy was slated for development; instead, the county bought it and will restore it to prarie, which is expected to curtail flooding of Lake Mendota in Madison. See <https://pheasantbranch.org/wp-content/uploads/2019/09/19FallFOPBCNewsFinalWeb.pdf>.

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