

Statement by Professor Calvin B. DeWitt to the
Commissioners of the Capitol Area Planning Commission
October 9, 2014

Dear Members of the Commission,

I am Calvin B. DeWitt, Professor Emeritus, and an environmental scientist at the University of Wisconsin-Madison, whom you know from my earlier presentation to the Commission on August 8, 2014 on “Waubesa Wetlands in Scientific Context.” Thanks to you, my PowerPoint presentation on the science of this ecosystem is now accessible on your website (www.capitalarearpc.org/).

As you know, for three decades I have researched Waubesa Wetlands with my graduate class, Field Investigations in Wetland Ecology, at UW-Madison. Spencer Black's column in the *Capital Times* on August 20, summarized our research finding well as he wrote, “the Waubesa wetlands have retained their remarkable ecological value. The area has been protected by the Nature Conservancy because of its biological importance and has been designated as a State Natural Area by the Wisconsin Department of Natural Resources.” And “The Wisconsin Wetlands Association names it as one of our state's “wetland gems.”

I appreciate greatly the opportunity you already have given me to put this jewel in the landscape into scientific context. I also appreciate the times the City of Fitchburg has provided me in describing the larger system of which Waubesa Wetland is a part—a system we are coming to now and understand as “the Fitchburg-Waubesa Artesian Basin.” I also appreciate Bill Horns’ response to Spencer Black in the *Capital Times* on August 28, and especially our shared appreciation of the time and attention Fitchburg has given this. But I counter his suggestion that development of the NEN poses no greater threat than current agricultural practice. Paving over poorly cared for soil with urban development is not a solution to poor soil stewardship.

At one of the two CARPC hearings during your last meeting on September 11, one of the two applicants said they took seriously the work of the Wisconsin Initiative on Climate Change Impacts (WICCI) and not develop right up to their borders, leaving space available for adaptation to foreseen and unforeseen climate change. This is an expression of the wisdom we need tonight.

I am speaking in opposition to the proposed revision of the Urban Service Area, identified by Fitchburg as the “Northeast Neighborhood” (NEN), for reasons of climate and related factors.

First, I believe it unwise and unnecessary to press urban development right up to the north and east boundaries in a city of some 36 square miles whose central core is miles away, because this would compromise and eliminate the possibility of climate change mitigation for intensified rainfall and flood events—and also, consequential ecological and financial losses for the City of Fitchburg, its neighbors to the east, to Holtzman Marsh and the Waubesa Wetlands gem, and, very significantly, to the water quality of Lake Waubesa and its hundreds of shoreline residents and their expensive lakeshore properties.

In stating my case to you, I need first to describe how the World Meteorological Organization (WMO) defines what they have been calling “climate normals”—used “as reference points by climatologists to compare current climatological trends to that of the past.” The WMO “climate normal” is defined as “the arithmetic average of a climate element”—like rainfall—over a 30-year period. A 30-year period is used, because it is long enough to filter out inter-annual variation, and short enough to be able to show longer climatic trends. The current “climate normal” period is calculated from 1 January 1961 to 31 December 1990.

It is a common practice of engineering and planning firms to use this same “climate normal” from an earlier 30-year period for sizing the needed capacity of rainwater detention and processing systems—systems they design for what they often call “stormwater management.” This was the procedure used here for Fitchburg. It is important to note that the WMO uses this “a reference point to compare current climatological trends with the past.” The firms we employ, however, uses this for another purpose: to determine the size of retention and treatment systems.

1. What this means is that planning for floodwater and stormwater for this site does not take into account the actual experience—from what we actually *measure*—about the increased intensity of rainfall events over the past one or two decades. At typically-used “climate normal” for the Madison area for the month of June is 4.54 inches for the Madison area.

However,

- In 1996 June rainfall was 2.1 times higher at 9.69 inches.
- In 2008 June rainfall was 2.4 times higher at 10.93 inches, and...
- In 2013 June rainfall was 2.4 times higher at 10.86 inches.
- In 2014 June rainfall was 2.1 times higher at 9.55 inches.

But this is not all.

Usually the design is not only based on a 30-year average, it is also based on only 80% of that figure—according to what is called “best management practice.” This means that rainfall would have exceeded the capacity of designed retention by 2.7 times for June, 1996. For 2008 and 2013 June rainfall would exceed the design capacity by a factor of three. And for 2014 June rainfall would have exceeded 2.6 times the designed capacity.

If we move from the Madison to Baraboo region for a 10-day period of rainfall that totalled 17 inches in June 2008—as reported by WICCI—in contrast to the 4.54 inch 30-year average design capacity, we would have rainfall 4.7 times greater than could be handled.—more than 4 and half times! These means that 21 per cent of the rainfall would be retained. And what would happen to the other 79 per cent?

For the proposed NEN area, it moves downstream, runs beneath Larsen Road into the Holtzman Natural Resources Area and the Holtzman Marsh. There it joins run-off from the Meadowview subdivision that floods Holtzman Marsh, backing up water from the west and north. And then in time it moves south along the east side of Larsen Road to enter Swan Creek near the junction of

Larsen and Goodland Park Roads. From there it moves on through Waubesa Wetlands and into Lake Waubesa, carrying with its load of dissolved and suspended materials and nutrients.

2. The plan for the NEN does not explicitly address the increased intensities in rainfall, as I have illustrated here for the month of June. The city and the engineering firms, advisory and planning agencies at a minimum must use *measured* rainfalls of the past two decades in doing their design of rainwater retention and treatment. And it is vitally important for these entities to hold in reserve enough land area between them and downstream human and natural communities for probable future mitigation.

3. Finally, it is necessary to recognize and confront the problem that current rainwater detention and processing ponds been designed based upon rainfall records of earlier decades. During high rainfall events in September of this year, Swan Creek at Lalor Road and County Highway MM had opaque, coffee-colored flows, and these went on its course into Waubesa Wetlands, continuing to nourish wide borders of invasive Reed Canary grass along its banks, and then on into Lake Waubesa. These systems—designed for an earlier climate with less intense precipitation events—now also are failing, and their increasing contribution to the degradation of things downstream needs to become a priority.

Spenser Black in his column on Waubesa Wetlands reminded us that Dane County is growing because it is attractive to people and business and that we need to preserve that attractiveness. And, saying, “We don’t have an alternative for the biological richness of the Waubesa wetlands,” he concluded:

We should conclude at this point that the far northeast corner of Fitchburg should have its landscape functions restored, including its prime agricultural land and the wetland area within it that has been put into agriculture. It should not become a new Urban Service Area but enhanced for the ecosystem services it once, and can again, provide.

In the early morning of Thursday, September 4, an intense thunderstorm dropped some three inches of rain onto the Swan Creek watershed in eastern Fitchburg. That evening, at 7 pm, I photographed Swan Creek at Lalor Road, south of Goodland Park Road, and 10 minutes later at County Hwy MM near its junction with Haight Farm Road. Swan Creek was in flood stage; its moving water an opaque chocolate-brown color, with no transparency. A month ago in my Power Point on August 8, I presented a photo of Swan Creek at Lalor Road in similar conditions—conditions of high turbidity and heavy sediment load.

A few weeks earlier I canoed from Lake Waubesa up Swan Creek into Waubesa Marsh, on water whose turbidity was so great that visibility ranged from 1 inch to zero depth. This time there had been no flood, but turbidity was extremely high and visibility extremely low. As I progressed up stream a photographer captured the scene. Swan Creek, as this video documents, is nearly totally bordered by Reed Canary Grass—a strong indicator of heavy nutrient loading. A short while later we entered Murphy Creek, that enters from its largely natural and agricultural watershed,

also in Fitchburg. The contrast was great: its water was clear, and it was bordered mostly by native vegetation such as BlueJoint Grass, with very little Reed Canary.

These observations, and much more, brings me to conclude, reluctantly, that the current practices for managing stormwater and maintaining reasonable water quality of Swan Creek by Fitchburg, are not doing what they are intended to do. I have little reason to question here the good intentions of the city, with its good record of environmental stewardship. My assessment however, is that the city's current practices are seriously short of their stated goals of responsible and effective watershed and stream stewardship.

The consequences of the ongoing discharge of these heavily-silted and nutrient-rich waters into Waubesa Wetlands and Lake Waubesa are unacceptable. The continued attractiveness of Waubesa Wetlands and Lake Waubesa are being seriously threatened under existing practices. To allow an extension of these and similar practices even while existing practices are ineffective is unconscionable and it neglects viewing the watershed in the context of its receiving lands and waters, insults the wider community's four and more decade stewardship of Waubesa Wetlands and Lake Waubesa, and is scientifically ungrounded.