Wisconsin Buffer Initiative

(see note below for background)

Using data collected from working farm fields as opposed to simulators or sample plots, research courtesy of WBI researchers and the UW Discovery Farm program, indicates that the most useful places to control runoff are in areas of concentrated flow. As these areas are identified, technicians can evaluate the field and determine what mix of practices is needed to minimize the runoff. It is clear that in many cases the mere presence of a vegetative buffer may accomplish little unless the concentrated flow is addressed. This suggests that the common "solution" to nonpoint runoff from agricultural fields – buffers, the more the better – is an incomplete approach to the problem. Buffers, combined with appropriate upland practices and focused where they will do the most good, is a more effective solution. A second team of researchers is adapting the SNAP model (nutrient management software) with the goal of enabling county personnel to enter soil type and physical and cropping data for individual fields and evaluate what practices are needed to reduce runoff and protect water quality.

Other data coming from the Discovery Farms and related research measures the amount of N and P going into a buffer, and the amount of each coming out, or the net reduction across the buffer (P is being measured as total P, dissolved P, and dissolved reactive P). Samples from 2 ½ years of runoff events are being collected and analyzed, yielding what may be the first-ever data for snowmelt events, a significant source of runoff. Combined with data on the width and vegetative composition of specific buffers, this research may provide a scientific basis for buffer design to improve water quality.

State and federal programs to combat nonpoint runoff share one thing – they lack sufficient money to pay for full implementation where needed. Recognizing this, another WBI science team is using GIS data to rank watersheds in Wisconsin to help determine how to obtain the most water quality benefit for the least money. This group started with the 8-digit HUCs (about 3400 km^2) and, using 30m DEMs, delineated those watersheds in the state that consist primarily of first- and second-order streams (those most likely to show a measurable benefit from buffer technology). This methodology enables us to determine what size our "target" watersheds should be (anywhere from 20 to 100 km^2). The ultimate goal is to improve the water quality of the third- and forth-order streams, with larger streams/rivers benefiting as the program is expanded.

Once the watersheds are delineated, we can then rank them primarily using data from the state's 303-d list, and our list of outstanding or exceptional resource waters (actually, we use a weighted matrix that can address a range of local concerns). Policymakers will then decide which watersheds to address with the limited funds available, depending on their desire to improve degraded waters or maintain outstanding waters. It appears that other states/provinces would be able to do the same for their waters, in this case those that flow into the Great Lakes basin. No one denies that buffers can benefit most any water body, but when resources are limited, this sort of tool can help determine where they should be focused. Note that this is a far cry from the standard program model of "spend a little bit in every county" or variations thereof.

Finally, the WBI policy subcommittee is evaluating how the WBI can integrate with existing state and federal programs. This is especially true of the CREP program. There are two aspects of the current CREP program that are troubling. The first is its all-volunteer nature. We have plenty of evidence in our state that all-voluntary programs leave serious gaps when it comes to water quality. In order for states to meet their water quality goals, they will need to move from strictly

voluntary to some form of mandated practices. However, to avoid conflicting with the CREP rules, the states need to know how they can craft such a program so as not to conflict with the USDA rules. Without this understanding, we could see any targeted watershed becoming ineligible for CREP funds, which would be counterproductive.

The second "problem" with CREP is how it is being implemented on the landscape. Here, the program looks a good deal more like a landowner support system than a water quality program. In practice, landowners are encouraged to sign up buffers of the maximum depth. Those who choose otherwise have their buffers designed to achieve the water quality goals of the program. If all landowners were restricted to this standard, the existing state and federal monies could be used to protect more stream miles in a more effective way.

WBI Background

When Wisconsin enacted far-reaching standards for non-point pollution control four years ago, the rules left out a riparian buffer performance standard for agricultural land. This decision was based on two factors: the high cost of taking land out of production would severely limit the application of other practices, and uncertainty over the actual effect of vegetative buffers on water quality. At the same time, the Wisconsin DNR committed to a process that would provide the basis for a vegetative buffer standard to go into effect Jan. 1, 2008. Hence, the WBI, and its charge to develop a recommendation to the DNR by Dec. 31, 2005 for establishing a performance standard for vegetative buffers based on the best available science and adaptive management.

The WBI consists of stakeholders (producers and conservationists), agency staff (DNR and Department of Agriculture, Trade and Consumer Protection), and researchers and staff from the UW College of Agriculture and Life Science. Following an exhaustive review of the literature, it became clear that very little research on buffers went beyond rain machines and small plots. Furthermore, nearly all of it was focused on sediment control and failed to examine how the chemistry of the runoff actually impacted the receiving body of water. With $1.5 million in federal funding across three years, courtesy of U.S. Sen. Herb Kohl, the science teams are well on their way to providing new tools to improving the water quality benefits of buffers and related practices, and giving policymakers and field agents new tools for setting priorities and implementing the required practices on the ground.

For more information on the WBI, including profiles of the science researchers and other steering committee members, go to http://www.cals.wisc.edu/wbi/

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