Shaping new drainage solutions

In Polk County, one farmer's quest led to the creation of the Sand Hill River Watershed District and ditch specifications now widely used in Minnesota

"When you go into a water problem, 99 percent of the time it's nothing to do with water."
— Daniel Wilkens, recently retired Sand Hill River Watershed District administrator, Red River Watershed Management Board founding member, stakeholder Drainage Work Group member, longtime farmer

Left: *Daniel Wilkens attended the Minnesota Association of Watershed Districts' annual conference in November in Alexandria. Wilkens played a central role in the Sand Hill River Watershed District's drainage improvements.* **Below:** *The Sand Hill River flows through farmland.* **Photos:** Ann Wessel, BWSR

CLEAN WATER LAND & LEGACY AMENDMENT

Inspired by drainage needs on his own Polk County farm, Daniel Wilkens started what turned into 50 years' work on water solutions. Those solutions — flatter ditch side slopes plus side inlets and wider buffer strips — became standard in the 500-square-mile Sand Hill River Watershed District and beyond.

Today, the watershed's 89 miles of ditches are quite stable with 4:1 side slopes, side inlets, and buffer strips measured from the top of the slope and extending 1 rod into the field. Rarely do these ditch systems require clean-outs.

Starting the first drainage project took hours of legal research, the establishment of a watershed district and 12 years' time — including 10 years of work to secure petitions, establish the project, and achieve a unanimous vote from the board of managers.

Wilkens began researching the 1955 Watershed Act in 1969, soon after he married and bought a farm near Fertile, 20 miles from where he grew up. Drainage was poor. His father had farmed 3,000 acres in the valley south of Crookston, where drainage also was poor. Wilkens recalled one year when it was too wet for his father to plant any crops. Wilkens' job that fall was to till fields full of 6-foot-tall weeds.

"You'd lose your crops all the time because of flooding. And I think that maybe does something to you internally. At least it did to me. You wanted to try to fix these things," Wilkens said.

So Wilkens researched the law. He had help from Erling Weiberg, executive secretary of the Minnesota Water Resources Board, a precursor of the Minnesota Board of Water and Soil Resources (BWSR). With Don Ogaard, the Red River Watershed Management Board's first and longtime chairman, Wilkens later worked to build watershed districts in the Red River Valley.

"This land is just beautiful land. There's not a … drowned-out crop, people are making money every year, paying their bills," Wilkens recalled remarking last fall on the way back from a site visit with a Sand Hill River Watershed District board member. "In this day and age you can't miss crops. It's just too much money in the ground."

Here the land is flat, the soil is relatively impervious clay. Without proper drainage, water stands on the fields. Working with gentle field swale and ditch slopes allows standing water to drain. But a hard rain creates a mud slurry. Imperceptible in the field, it carries topsoil that eventually fills road ditches and county ditch systems — which then require cleaning out every few years, if good science and experience isn't used.

When north-flowing spring floodwaters reach snow- and ice-filled frozen ditches, they have nowhere to go.

Recently retired Sand Hill River Watershed District Administrator Daniel Wilkens talked about drainage with Chief Engineer Al Kean of the Minnesota Board of Water and Soil Resources.

The first ditch was built with 3:1 side slopes along the township road and 4:1 slopes on the field side with open field swales into the ditch. The rest — including Wilkens', which was No. 3 on the list — were built with at least a 4:1 side slope and side inlets. Required 1-rod buffer strips also were installed.

Once farmers saw how well it worked, they petitioned for similar ditch improvements.

"All of a sudden these people see, 'These guys to the north here, they're not drowning anymore. They're getting crops every year. We're getting one out of 20. It's not good. So maybe we need some.' So it started a roller coaster, and then we started doing more ditches. We've done them all, all the way across the watershed now," Wilkens said.

Flatter side slopes made the banks more stable, an important consideration given the region's clay soils. Additionally, flatter south-facing side slopes on the east-west ditches got more sun, so thawing started sooner.

"You don't have the field runoff running onto nothing but ice and snow in the ditch. So it has stability, which also means better erosion control on that side slope," said BWSR Chief Engineer Al Kean. "Even in terms of drifting full (of snow), with a flatter side slope you don't have as much of a problem (in the spring)."

Not until later did the full benefit of side-inlets become apparent in the Sand Hill River Watershed District. At first, they were simply a way to meter the water.

Kean said it was a more equitable use of ditch capacity.

"And the ditch worked," Wilkens said.

"In the process, you solved a lot of erosion problems," Kean said. He elaborated.

"By metering flow, you create short-term ponding on the field that causes sediment to drop out. So you meter flow and trap sediment — and if there is a significant difference in elevation between the runoff from the field and the bottom of the ditch, then you're solving what otherwise could be a head-cutting erosion problem."

The ditch buffer strips helped curb wind erosion by trapping sediment. They also provide good access for ditch inspections.

To keep drainage projects moving forward, Wilkens applied a lesson he learned as a township snowplow driver.

"About every 10 miles … there's a different leader. There's different ethnic backgrounds, different religious backgrounds and values. If you're going into a space like that to sell ditching, for example, you need to know who the leaders are, their value system and all the rest of it," Wilkens said.

So every project had a local promoter.

"Everything in this world takes an idea, which is cheap. They're plentiful. And then it takes money, which everybody thinks is the worst part. But that isn't," Wilkens said. "You can have money and you can have an idea but if somebody isn't pushing it, it ain't going nowhere."

As Wilkens' watershed work grew, he dealt with flooding issues on a larger scale. He's an original member of the Red River Watershed Management Board, founded in 1976; and past chairman of the Red River Basin Commission (RRBC), a 41-member board that deals with flooding and other water issues in Minnesota, North Dakota and Manitoba

He reflected on his No. 1 achievement with the Red River Watershed Management Board.

"The biggest accomplishment (was) having funding and a place to learn from each other," Wilkens said. "We had funds to gather knowledge, to work on myths and get science. It was the key to all other water management in the valley."