pumping and purchasing

With numerous landlocked basins, the Valley Branch Watershed District (VBWD) has been hit particularly hard with flooding this year. Right now, water levels at some lakes are at or near their 100-year flood levels. On some of these basins, homes are at risk of flooding and roads and highways have been underwater.

As the District's engineer, Barr has worked with private and public partners to pump down water levels on several lakes—in one case the water has been pumped to a storage area with a high infiltration rate; two other lakes have been pumped to a system that conveys runoff to the St. Croix River.

In the Sunnybrook Lake area, where water is particularly problematic, VBWD has obtained a bond to purchase the lowest homes. "It is a fail-safe approach," said John Hanson, Barr engineer. However, it comes with the challenges of determining what to do with the homes and abandoning the septic systems and wells. Barr is helping VBWD navigate those problems as well.

modeling and monitoring

With a rapid spring snowmelt and rainfall in early 2019, Barr recognized the potential for regional flooding in the Ramsey-Washington Metro Watershed District (RWMWD) starting in early March. We used existing computer models of the watershed to run a series of snowmelt event scenarios, with depths ranging from 3 inches (the minimum anticipated runoff depth) to 7.2 inches (the 100-year, 10-day snowmelt event). Using these model results, we created a suite of charts showing structures and roadways at risk of flooding depending on the snowmelt event. This rapid response to flooding concerns allowed this information to be shared with the RWMWD's municipalities to help them anticipate and plan for potential flooding problems.

RWMWD staff continued to monitor water levels in areas perceived to be at greatest risk, comparing changing water surface elevations to the modeling results. By late March, updated charts showing the actual monitored water levels of each water body were sent to the municipalities to show how these areas were faring during the snowmelt event—again, helping them with ongoing flood planning and response efforts.

In VBWD, we've used 60 years of data to do long-term continuous modeling, evaluating flood protection strategies in flood-prone areas. "We've been able to evaluate protection strategies, quantify benefits to properties with low homes, and understand consequences

Street flooding in Lake Elmo (spring 2019)

to downstream lakes to find the best approach for protecting properties—whether it's optimizing flood storage, constructing an outlet, designing a ring levee, or raising the house," said Hanson.

Over in the city of Edina, Barr staff modeled and monitored water levels in multiple problem areas. In all cases, these efforts were very instructive. Results showed that infrastructure was not working as intended. "If you model and monitor," said Barr scientist Sarah Stratton, "you can find out if systems are working the way they're designed."

technical support and communication

Stratton has also provided technical support to an Edina citizen task force charged with helping develop a flood-risk-reduction strategy for the city. According to Stratton, the task force is looking at a number of recommendations beyond flood mitigation. These include community education and communication—sharing information about general flood resources as well as services the city can provide.

planning ahead

The National Oceanic and Atmospheric Administration's (NOAA) Climate Prediction Center winter outlook anticipates higher-than-normal precipitation in Minnesota from December through February. In light of the flooding conditions in 2019 and concern about continued flooding in 2020, Barr engineers met to discuss the variety of flooding issues across the different watershed districts and municipalities. Part of the purpose was to prepare for what is certain to be a difficult spring—and unpredictable years ahead. Said Barr engineer Scott Sobiech,"We need to be planning for the future: 20 years down the road."

If you need help with short- or long-term planning—or with any of the other services noted above—contact Erin Anderson Wenz, 952-832-2805, eandersonwenz@barr.com.