

Many lakes in Hubbard County are at low levels. I thought this article would be of interest. It is based on Wisconsin lakes, but it can still pertain to our area too. It is from "Lake Tides" a newsletter from Wisconsin.(editor)

Depending on the type of lake, you may be noticing a drop in water levels. If you live near a lake where water levels are controlled by a structure such as a dam, you may not be noticing such a drastic drop as someone located on a natural glacial kettle lake. Seepage lakes, on the other hand, typically have water levels that are controlled by the elevation of the groundwater table. Because of this they are usually more susceptible to water level fluctuations.

So if groundwater plays a big role in water levels on lakes and baseflow to streams, what controls groundwater levels? Groundwater levels (the amount of groundwater in aquifers) are a reflection of the amount of water percolating into aquifers from the soil (groundwater recharge) minus the amount of groundwater discharging from aquifers to surface waters and wells. An easy way to look at it is by comparing it to a bank account, where:

Credit = Debit = Net Savings

Rain/snowmelt -- Runoff/Use by Plants = Groundwater Recharge,

Groundwater is a product of rain and snowmelt, which is your annual credit. This credit, in terms of precipitation, equals about 31 inches per year. The rain or snowmelt that becomes runoff or is intercepted by plants, is your debit. This makes up the majority of your account, about 21 inches per year. Your net savings is groundwater recharge. Typically, in the central part of the state the net savings is about 10 inches per year. That is your profit to spend (wisely or foolishly). If you spend too much you run into the red; conversely, if you spend wisely you run into the black. If a reduction in recharge continues, or too much money is spent, you may start to see the impacts in low water levels. Sometimes this is natural, such as a drought; other times it may be influenced by our choices in land uses.

Factors like persistent drought are basically beyond our control and have been occurring for millennia. This flow of ups and downs is natural, and will continue to occur. Unfortunately, there is not a predictable cycle and these ups and downs can range over many

years. While it might be a very short time for Mother Nature, for us it can be a good portion of our "riparian life." For Example we can look at groundwater monitoring well records across the state and see that low water levels have happened before. We can see that in the late 1950's to mid-60's we experienced comparable or lower levels than we have now. Conversely, the high peak seemed to occur in the early 1990's, which coincides fairly well with precipitation trends. Since then, we have been on a decline that is nearing the previous late 1950's to mid-60's levels.

Development along lakes has also increased since the 1960's. Many people may not recall such low levels simply because they were not on the water then. In some lakes, stumps from young trees can be found well below the Ordinary High Water Mark (OHWM), which suggests extended low water periods. These periods were low enough and lasted long enough for small trees to invade and grow before drowning out as water levels returned closer to the OHWM. Again, these cycles may occur over a relatively short period of time for the natural world, but can be a long time for us.

As development pressures of our groundwater resources continue, we see that perhaps we are running a little closer to the red at times. As we have filled wetlands, created large rooftops, and paved riparian areas and shorelines, we have increased runoff (a debit) and decreased our recharge rates (savings). As we literally tap into our groundwater bank accounts to remove water for municipal and high capacity wells, we remove even more water that is not returned as recharge, but lost as runoff and evaporation (debits). In fact, water table elevations have decreased by several feet in large urban areas and the recharge rates in heavily irrigated lands can be reduced by nearly half (about 5 inches per year). Combine this human influence with natural drought conditions and the natural low may become even lower.

But are low levels all that bad for lakes? The natural flux has been happening for millennia and we know that many species of plants and animals have evolved to adapt to changing water levels. In fact, some high value plants such as bulrushes are dependent on this flux. As water levels decrease, emergent species of plants along the shore expand toward the lake. When water levels return this expansion of plants becomes habitat for fish and wildlife, removes nutrients from water, and helps increase water clarity. Think of the process as the

lake healing itself. Without this normal water level flux, the species that make a lake ecosystem what it is cannot survive.

There is an inherent rise and fall to lake levels. The natural low-level phase should be welcomed with an understanding that this is a time of healing and rebirth for a lake. We have learned to tap into our groundwater accounts, which is necessary to some degree. However, we can exacerbate low level conditions through our land use practices that limit groundwater recharged and by overspending in lean times. Will lake levels come back? Most likely, but Mother Nature determines that. We can help her out by being frugal when we need to be.

by Scott Provost, Water Resources Management Specialist, Northeast Region, Wisconsin DNR