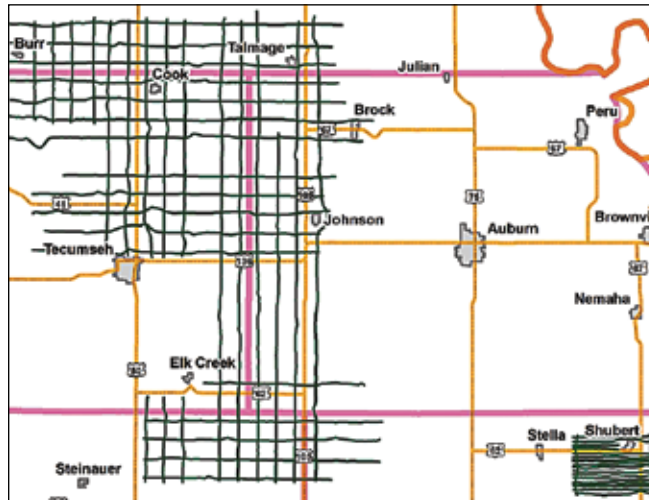




## Nemaha NRD 2018 AEM Results Published

Last summer from June 13th to 17th approximately 580 line-miles of airborne electromagnetic (AEM) survey data was collected by helicopter. The purpose was to help convey a better understanding of the hydrogeological framework of the areas flown and assist the District with groundwater management decisions. Aqua Geo Frameworks, LLC (AGF) was contracted by the Eastern Nebraska Water Resources Assessment (ENWRA) group of eastern NRDs, of which the Nemaha is a member, to collect, process, and interpret AEM data. The final report "Airborne Electromagnetic Mapping and Hydrogeologic Framework of Selected Regions of the Eastern Nebraska Water Resources Assessment Area" has been completed and can be found online at [www.enwra.org](http://www.enwra.org); select the 2018 AEM button – from there scroll down to find "Nemaha NRD 2018 AEM Results". Listed are all the documents produced and the Google Earth datasets available for downloading. A full set of instructions is provided on how to download the data and upload it to Google Earth. Once uploaded, data from each flight line can be viewed illustrating four



"Flight lines for AEM project in June, 2018."

types of aquifer units encountered – non-aquifer, marginal aquifer, principle aquifer and coarse aquifer. The report and data are also available at the NRD office, and landowners where the flight path was flown over are encouraged to stop in or view online.

NOTE: You can view flight lines from some mobile devices if you have Google Earth, but you need to use a Microsoft Windows computer to see the data and hot linked profile images.



"Jessica Donnelly takes the oath of office at the March, 2019, board meeting."

## Donnelly Joins NNRD Board

Jessica Donnelly is the newest addition to the Nemaha NRD's board of directors following her appointment in March to a vacancy in Subdistrict 4. Though Portland, Oregon, is her hometown, she now resides in Nebraska City after having graduated from Doane University with a degree in environmental science. She works in the Land Planning and Aid section of the Nebraska Department of Environmental Quality in Lincoln. Donnelly notes a keen interest in diversifying her knowledge on environmental topics, especially when it comes to the community in which she lives. Since no one ran for this position in the 2018 general election, her term will expire in two years.

## Confined Aquifers 101

Many of the aquifers in southeast Nebraska are considered confined aquifers which means it has impermeable layers both below and above the aquifer. A unique characteristic of a confined aquifer is that the water is under pressure. When a well is drilled, the pressure will force the water to rise in the well resulting in a misleading, elevated water level. If there is enough pressure to push the groundwater to the surface, it is referred to as an Artesian well. As more wells are drilled into a confined aquifer, the pressure is relieved; and water levels in wells begin to drop and eventually will decline to the true water level. If the water level drops enough, it will impact shallow wells. Therefore, we encourage that new wells always be drilled to bedrock to assure accessibility to the entire aquifer and reduce issues with any future water level declines. It costs more to drill the

initial well; however, it is far cheaper and easier to adjust to declining groundwater levels by lowering a pump than having to drill a replacement well. Most of the irrigation development in Nebraska is in unconfined aquifers like the Ogallala, so this issue is more common to this area.

Many of the well interference issues we see in the Nemaha NRD are a result of well development in confined aquifers. It is very difficult to predict how a confined aquifer will react to development thus making management a challenge. Often the volume of water in the aquifer is not the problem; it is the decline caused by relieving the pressure that creates an issue. As more data is collected, the NRD is starting to get better knowledge about our complicated groundwater system. Recent efforts such as the AEM flight project are important steps in that process.

# Let's Go to the Parks!

Summer recreation season is here, and that means heading to one of the five Nemaha NRD recreation areas. Even though it was wet and the lakes were substantially above their normal level, we've still had full campgrounds and many users at the lakes. Entry permits are required at all areas except Prairie Owl and may be purchased online ([nemahanrd.org](http://nemahanrd.org)), at the parks, or on weekdays at the NRD office in Tecumseh. Camping is first-come, first-served; and fees must be paid within 30 minutes of arrival. Saving campsites with signs, vehicles, tables, boats, or other objects is not allowed even if the payment is made.

Here is what you can expect at the NRD recreation areas this season:

## Duck Creek

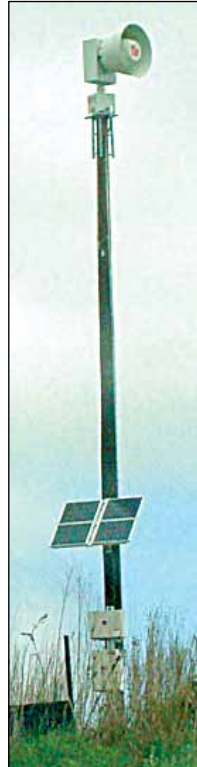
In its second season of operation, excitement for the area remains high. Last year weekends meant plenty of campers, kayakers, and anglers of all ages. We expect the same this year. Group activities are very popular at Duck Creek; and if you have a group of 20 or more, we encourage you to let the NRD office know about your activity. It is particularly important if you plan to use an area with limited room such as a shelter or the beach.

If you plan to try your hand at fishing, remember that no live baitfish may be used. Baitfish includes a variety of different species of creatures including things like crayfish and salamanders, so it's good to check the Game and Parks fishing guide. Largemouth bass must be 21 inches or longer to keep, and the fishery has matured enough we may start seeing some 21-inchers this year!



**Above: Primitive camping options are available at Duck Creek.**

**Right: Nemaha County installed an emergency siren at Duck Creek last year to alert visitors of impending hazardous weather events."**



## Kirkman's Cove

This 160-acre lake near Humboldt continues to be popular with boaters, beachgoers, campers, and golfers. In April new concrete restrooms were installed in the day-use area and near the boat ramp replacing aging wooden structures. The NRD is nearing its goal to replace all the old, wood structures, and we hope to have them all replaced in the next few years. Look for a new sign at the west entrance at Highway 4 to replace the old wooden sign that blew down last summer. High water levels and ice damaged the boat dock this spring, and it has been temporarily repaired. Permanent repairs should be completed this summer.

## Iron Horse Trail Lake

The NRD has been working with Game and Parks to remove invasive trees such as cedar, locust, and Osage orange which have started impacting the hardwood forest areas around the lake. We had hoped to have this completed over winter; however, weather delayed the project. Work is now scheduled to begin in July and be completed by October.

Iron Horse is popular with campers; and since there are only 11 electric RV pads, they fill up fast on summer weekends. Look for new signage around the 2.5-mile loop trail.

## Wirth Brothers Lake and Prairie Owl

A minor facelift is in store for the facilities at Wirth Brothers Lake this year. A primitive RV pad was recently completed near the beach parking area. New signage will be installed including a new entrance sign, and rubber mulch will be installed around the playground equipment. With all the rain, Wirth Brothers' 36-acre lake is full.

Prairie Owl south of Dunbar is the only area where an entry permit is not required. No major changes are planned this year. However, trash service is no longer provided; so please remember to take your trash with you when you leave.

## Water Testing at Recreation Lakes

The District collects water samples weekly at all our recreation lakes, usually on Mondays, with results available by Friday. Blue green algae are bacteria that look like algae, hence the name. The results are a snapshot of the status of the algae on the day they were collected, and conditions can change; so using common sense is always advised. Historically Iron Horse and Kirkman's are the lakes that have issues with blue green algae, and it is difficult to predict when an outbreak may occur. If health alert levels are reached, it is posted at the lakes, on our website, and on our Facebook page. Normally we see one health alert outbreak per year at each lake, but we have had years with multiple occurrences.

Our lakes are also monitored for E. Coli bacteria. This is a common bacterium found in the intestines of humans and other warm-blooded animals. It usually spikes in lakes after heavy runoff events, but levels drop off quickly after a couple of days. It does not become a health concern unless fecal coliform levels are consistently above 200 cells per milliliter, which is not the case in the NRD's recreation lakes. Park users might want to avoid swimming or wading for a day or two after a moderate to heavy rain event.

## Steamboat Trace



**"The trailhead in Peru remains covered with debris in late May."**

Much of the Steamboat Trace trail which parallels the Missouri River in Otoe and Nemaha Counties sustained extensive damage as a result of spring flooding. Some segments have not been assessed because

## Steamboat Trace (Continued)

they are still inaccessible. As with past floods water left silt, debris, and often removed the rock surfacing. Unlike past floods this spring's event resulted in damage to the trail base in some areas, which will require more extensive repairs. It appears that damage to bridges was minimal.

The NRD hopes to work with FEMA to help get the trail repaired and opened again. At this time there is no set schedule for making the repairs, so it is expected that the trail will be closed all year. The trailhead facility in Peru was also damaged and will need some repair work.



**“Steamboat Trace at north edge of Peru – water still covers some of the trail in late May.”**

### From the Manager's Desk → *by Bob Hilske*

## Memorial Day at Lake Michigan?

It's Memorial Day weekend and you planned a big camping trip with the family at your favorite Nemaha NRD recreation area. The camper is stocked with food; you checked the cooler to make sure someone didn't "accidentally" put any beer in there because we all know that's illegal at NRD parks; the beachballs, fishing poles and charcoal are all loaded up. Don't forget the leash for the dog. Then you get to the park and not only is the only spot left in the campground right next to "Crazy Bill" and his stereo with speakers that look like they are leftover from a Rolling Stones concert, that nice 65-acre NRD lake turned into Lake Michigan overnight; what happened?

Dams are constructed for many different purposes including flood control, recreation, irrigation and power production. Although dams usually provide more than one benefit, the design is driven by the primary purpose of the structure. Flood control dams are designed to hold as much flood water as possible during heavy rain, then it is slowly released to reduce flooding. A dam designed for recreation does not incorporate as much flood storage, and flows are allowed to pass through it quickly which reduces the fluctuation in the water level. The NRD's lakes are considered multi-purpose; however, their primary purpose is flood control, hence the Lake Michigan effect after a heavy rain. Depending on how full the reservoir gets after it rains, it typically takes 3 to 7 days for the lake to return to normal level.

When planning recreation areas, facilities such as restrooms and picnic shelters that would be damaged by high water are installed away from the lake. So if you

have complained about buffoons at the NRD who put the restroom so far from the boat dock, now you know why we did that. Although it is not required, we try to keep RV camping areas out of the flood pool. We don't want you waking up in the morning thinking you signed up for a Caribbean cruise. Tent camping near the lake is usually okay; however, caution should be used if heavy rains are in the forecast. Water levels can rise quickly and continue to do so even after the rain is over. So unless you want a great future story to tell the grandkids about how grandma and grandpa almost drowned sleeping in a tent, move up the hill!

Boating is not recommended when water levels are high. Obstacles such as grills, picnic tables, and posts may be hidden below the water surface and would not be fun to hit with the old Evinrude. Kayaking and canoeing is also not advisable until water levels return to normal. Water quality issues including E. Coli bacteria tend to increase when heavy runoff occurs, and for safety and health reasons, it is not advisable to swim when lake levels are high. Caution should also be used after the water level recedes because it is common for debris to be in areas that were covered by water.

So has your holiday weekend been totally ruined? Never fear, there is still plenty to do ranging from hiking to using the playground equipment. It's always fun to sit around the campfire, tell stories, and toast marshmallows. Plus, I'm sure old Bill would be more than happy to let you listen in on his extensive collection of heavy metal music and tell you about his new hearing aid.

## NEMAHA NRD STAFF

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Scott Nelson, Assistant Manager  
Jane Kuhl, Administrative Assistant  
Kerri Miller, Administrative Assistant  
Lisa Bartels, Secretary  
Chuck Wingert, Water Resources Manager  
Charlie Pierce, Water Resources Technician  
Steve Bartels, Field Representative  
Mark McDonald, Field Representative  
Vernon Speers, Jr., Field Representative  
Aaron Stalder, Resources Specialist  
Tomas Chalé Aké, Field Technician  
Ken Hatten, Land & Water Resources Assistant  
Phil Vance, Seasonal Maintenance  
Peyton Harsin, Seasonal Maintenance  
Eric Sundar, Seasonal Maintenance

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Geraldyn O'Malley, Tecumseh  
Kim Zech, Syracuse  
Kathy Harlow, Pawnee City  
Laura Hart, Falls City  
Turner Moore, Tecumseh

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# Watershed Activities Update

## Upper Big Nemaha 25-C Rehabilitation Project

Recently bids were let to upgrade a dam known as Upper Big Nemaha Site 25-C (aka "Doctor's Lake") near Adams. Dixon Construction from Correctionville, Iowa, submitted a low bid of \$2.5 million dollars for the project. Plans involve the construction of an 80 feet wide by 12 feet tall concrete

chute through the dam which is designed to safely pass flows for a 100-year storm or a precipitation event of 6.9 inches of rain in a 24-hour period. Construction is anticipated to begin in September, 2019, and be complete by December, 2020.

### Dam Plug-ups

The Nemaha NRD encompasses an 8-county area in southeast Nebraska and is responsible for operating and maintaining over 350 watershed dams. With abundant rainfall, we have experienced a ten-fold increase in the number of dams plugging up from debris this past year. Sometimes pesky beavers are the culprit, but more often it is just mud, logs, sticks, or cornstalks that

get washed into the drainage area and end up plugging the dam inlets. We perform frequent inspections to make sure the dams are operating as they should, but monitoring 350 dams is challenging. We are grateful when landowners or the public report possible plug ups as this makes the job of operating these dams more manageable.

### Office Birthday

The "new" NRD office in Tecumseh celebrates its 15th birthday this summer. In June, 2004, the District made the move from the longtime location in town to the present location on Highway 136. The move has provided more office space for employees,

additional meeting room space, more parking, better handicapped accessibility, and ample storage for District equipment. District board and staff take great pride in how well the facility has aged, which will allow it to serve the public for many more years.

## CALENDAR OF EVENTS



### June

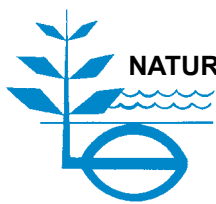
- 10-11 NARD Basin Tour, Loup Basin
- 13 NNRD Board Meeting, Tecumseh
- 16-19 ACE Camp, Halsey
- 22 Electronics Recycling Collection, Johnson County

### July

- 4 Independence Day Holiday, NNRD Office Closed
- 11 NNRD Board Meeting, Tecumseh
- 28-8/2 National Envirothon, North Carolina

### August

- 8 NNRD Board Meeting, Tecumseh
- 23-9/2 Nebraska State Fair, Grand Island



**nemaha**

NATURAL RESOURCES DISTRICT

62161 Hwy 136

TECUMSEH, NEBRASKA 68450

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- *Confined Aquifers 101*
- *Donnelly Joins NNRD Board*
- *Let's Go to the Parks!*
- *Duck Creek, Kirkman's Cove, Iron Horse Trail Lake*
- *Wirth Brothers Lake, Prairie Owl,*
- *Water Testing at Recreation Lakes*
- *Steamboat Trace*
- *From the Manager's Desk*
- *NEMAHA NRD STAFF*
- *Watershed Activities Update*
- *Office Birthday*
- *Calendar Of Events*

The Nemaha NRD's **Insight** is a publication of the Nemaha Natural Resources District. Requests to be placed on the **Insight** mailing list and/or comments regarding information in this publication should be directed to Jane Kuhl, Administrative Assistant, 62161 Hwy 136, Tecumseh, NE 68450. Phone (402) 335-3325