NRD staff measured roughly 500 observation wells throughout the nine-county district in April. The goal of these well measurements was to determine an average water level change for the district, based on a weighted change from each well. For spring 2020 water level measurements, staff has determined that the average groundwater level change shows an increase of 3.67 feet from last spring. The findings show that the spring 2020 average groundwater level is 8.78 feet above the allocation trigger. Thus, there will be no allocation restrictions for the 2021 irrigation season.

Observation wells are measured in the spring of each year, allowing the water table to rebound from the previous irrigation season. The wells that are measured are uniformly distributed throughout the district to provide an accurate profile of the average groundwater level change. Each well measured is assigned an area of the district based on distances from other wells. This method of averaging is known as the Thiessen polygon method and gives the average groundwater level change a weighted average. Last year’s spring 2019 level showed an increase of 1.22 feet and spring 2018 showed an increase of .87 feet. Fluctuations from year to year are common throughout the district. The Upper Big Blue NRD sits above the High Plains Aquifer, which stretches from South Dakota to Texas. This portion of the aquifer is

(continued on page 2)
Water Levels (continued)

...dynamic and different factors like rainfall and pumping affect how the aquifer reacts. In recent years, producers have done an exceptional job of managing use of this water resource.

Along with NRD staff measuring observation wells, all groundwater users are required to annually report their water use. This is how the NRD maintains records on historic groundwater usage. Groundwater user records are very important to the district for making informed management decisions. The 2019 district average groundwater usage was 2.2 inches, which is well below average pumping for the district. The district average groundwater usage is 5.9 inches/year since 2007. Presently, there are 1,241,505 irrigated acres and 12,208 active irrigation wells in the district.

The NRD’s goal is to hold the average groundwater level at or above the 1978 level. In 2005, the district average groundwater level reached the reporting trigger level, initiating groundwater users to report annual groundwater use to the district and to certify their irrigated acres. If the district average water level falls below the 1978 level (allocation trigger), groundwater allocation will take effect. These measures ensure equitable water usage for all district residents.

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### Average County Change

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</table>

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Historic Groundwater Withdrawal for Irrigation

- **Cumulative Change**
- **Allocation Trigger**
- **Reporting Trigger**

2019 Irrigation Withdrawal in Acre Inches

- **Less than 2.5 inches**
- **2.5 to 5.0 inches**
- **5 to 10 inches**
- **Over 10 inches**
- **Control Area**
- **Towns**
Nebraska Rainfall Assessment and Information Network - NeRAIN

NeRAIN is a program that is designed to help citizens be more involved with monitoring the weather across Nebraska. Several hundred volunteers within the program spend a few minutes each day recording precipitation measurements and uploading them to the NeRAIN website. This data can be accessed daily through maps and reports, spanning back to 2004. You do not need an account to access this data.

New volunteers are always welcome! Anyone can participate in this project, including children, educators, agriculture professionals, producers, and those interested in the phenomenon that is Nebraska weather. The only requirements are that each volunteer report weather conditions on a routine basis and that they have a valid e-mail address to create an account. Each time a rain, hail, or snowstorm passes through the area, volunteers are asked to take measurements of precipitation, as well as hail characteristics. These measurements are used daily by scientists, crop consultants, agriculture producers, utility providers, insurance professionals, natural resource managers, and various other entities. To sign up to become a volunteer and receive a free rain gauge, please visit the NeRAIN website (https://nednr.nebraska.gov/nerain) or stop by the NRD office to set up your account.

R Vers Rev Up and Wind Down

The camping season got off to a rocky start as the COVID-19 health situation meant that parks and amenities across the state were closed or had reduced access. The NRD followed the guidelines of the Nebraska Game and Parks Commission, reopening campgrounds at the five district recreation areas at the end of May.

“We are glad to be able to have the rec areas open for campers again,” said David Eigenberg, general manager of the Upper Big Blue NRD. “We hope that people will enjoy our recreation areas in a safe way for the rest of this season.”

Currently restrooms, picnic shelters, and playgrounds are closed at the NRD managed recreation areas and guests are asked to maintain social distancing, including having no more than ten people at a gathering. However other park uses, including boating, fishing, and hiking, are still available.

Campgrounds were full during Memorial Day weekend as families poured into the parks looking for a little R&R. Mary and Dave Seggerman from Fairmont are regular visitors to Anderson Recreation Area (Recharge Lake) campgrounds in York. The couple were among the first through the campgrounds gate when the facility reopened on May 20. Dave is a teacher and when the school year was over, camping was just what the doctor ordered after the stressful semester.

The Seggermans and their dog, Calleigh, like to walk the trails around the recreation area when they visit. Their other favorite activity? “Just chilling out by the lake,” said Mary with a shrug.
The wind is whipping across the cornfields on the outskirts of Stromsburg as the tree planting crew from the Upper Big Blue NRD sets about their work on a warm spring morning. Soon the birdsong is interrupted by the heavy thrum of a tractor. Kyle Yrkoski, district forester, loads the pull-behind tree planting cart with 18-inch high fir trees and climbs into the low seat. Jay Geiger steers the tractor slowly along the strip of dark, pre-tilled soil and Kyle begins dropping the young trees one by one through the opening between his feet. A wheel turns, marking the distance and making a bell ding every ten feet, alerting Kyle to drop in the next tree. Andy Larkin walks along behind, tamping the soil down around each sapling with his boot, making sure there are no air pockets present that would dry out the roots and decrease survivability.

With slow and steady progress, the team plants 500 trees and shrubs in just a few hours.

This tree planting project is a collaboration between the NRD and the City of Stromsburg. The city took advantage of the cost-share opportunities offered by the NRD through its Parks Program to add trees to Buckley Park, a high-use facility with campgrounds, aquatic center, playgrounds, ballfields, picnic shelters, and walking trails. The campgrounds currently have space for 9 to 12 RVs and are constantly in use through the summer months. The city is in the process of adding 20 more RV hookups and a dog run, expanding the park’s footprint to the west and making it more accessible for larger RVs.

They hope to have the addition complete for use in 2021 according to Lenard Schaefer, public works director for the city of Stromsburg. “Working with Kyle has been great because he walked me through the whole plan for the planting and recommended species,” he said, pointing out the strip of blue spruce that will provide a protective windbreak around the campsite. The planting also includes red osier dogwoods, lilacs, golden currants, and amur maples to provide color and shade through the area.

“These trees are essential,” adds city utility clerk Dawn Anderson, who has stopped by to snap a few pictures of the planting in progress. “If you’ve ever been to a campground along the interstate all you see is RV pads, no trees, and there’s nothing welcoming about that. These trees will give shade, a little bit of privacy, and a feeling of a more cozy setting. Trees will add to the whole ambiance.”

The trees will also provide wildlife food and habitat, as well as decrease soil erosion and the effects of flooding around the park, which is flanked by the Big Blue River on one side and Prairie Creek on the other.

Creating a welcoming, tree lined greenspace is more than just aesthetics, say the city employees—it’s a matter of economics for the small community. “People love the Stromsburg campgrounds because it’s so clean and it’s got facilities for the kids. This expansion will hopefully bring more people to town,” says Anderson. Local business owners are eager for the campground enhancements, as more campers means more shoppers for the downtown stores and restaurants a few blocks away, adds Schaefer.

“Trees add value to property, so it only makes sense that we would add more trees to our community,” said Anderson.

Each year, the Upper Big Blue NRD plants thousands of trees across the district. For more information about the Parks Program, Conservation Tree Program, and other community tree planting resources, visit www.upperbigblue.org/trees.
Nebraska corn growers know that applying the right amount of fertilizer at the right time is essential to a successful growing season. Too little applied can be costly at harvest if there is a yield reduction, but too much applied can also be an expensive error as it means paying for nitrogen (N) fertilizer that never gets taken up by the plants. In addition to the economic considerations, overuse of N fertilizer can cause environmental problems including drinking water contamination. It can be tricky to predict the needs of the growing season, identify the right amount and timing for N application, and to measure effectiveness at the end of the season to determine future action.

Recently published research from University of Nebraska Lincoln in collaboration with four Nebraska Natural Resources Districts, addresses this challenging situation. The research explores the relationship between crop yields and nitrogen input at the on-farm level in Nebraska over a seven-year period to establish a benchmark for how the region is doing with nitrogen balance in the soil. The study indicated that there is substantial room to improve yield and/or reduce N balance through agronomic management (including crop rotation instead of continuous corn). Achieving high yields with relatively small positive N balance are not conflicting goals as evidenced by the about 25 percent of producers involved in the study who are reaching these goals simultaneously.

At a field level view, a producer might not be able to look at this research and know with certainty that they needed to make a change in the amount or timing of their fertilizer application. However, they could see that in general, most producers in this area are leaving money on the table each growing season, using more nitrogen than is needed for a high yield. This research benchmarking provides a place to start as producers evaluate their practices. Benchmarking crop yields against nitrogen input levels can provide opportunities to improve N fertilizer efficiency and reduce N losses on corn growth by identifying fields most likely to benefit from improved N management practices.

The data used for the study was contributed by the Little Blue, Upper Big Blue, Lower Platte North, and Tri-Basin Natural Resources Districts. No producer identification was included in the data, only raw numbers that tracked nitrogen applied, yield, and residual nitrogen. “By sharing anonymous producer information with researchers specializing in agronomic data analysis, our board of directors is better able to make informed policy decisions,” said Marie Krausnick, water department manager at the Upper Big Blue NRD.

Producers in the cooperating NRDs may eventually have access to a personalized dashboard that will allow them to check their fields’ input efficiencies and benchmark against other fields in their area. In the future this type of tool could enable them to make data driven decisions that will save them money.

The research was primarily the work of Fatima A.M. Tenorio, a doctoral candidate in the Department of Agronomy and Horticulture at UNL. Tenorio presented this research at the Upper Big Blue NRD’s annual Project GROW Winter Workshop event in December 2019. View her presentation or read the full research article at www.upperbigblue.org.
Operators within a management zone that has been designated a Phase III Management Zone must have their irrigation water tested for nitrates at least once every three years. Presently, Zone 5 is the only management area in Phase III Management. Zone 5 includes Waco, New York, Lockridge, Bradshaw, Beaver, and Leroy townships.

Irrigation wells in Zone 5 must be sampled again by April 1, 2023.

Note: The latest three-year cycle ended April 1, 2020. Operators who did not submit samples were given an extension, due to 2019 being a short irrigation season. Letters were mailed to those not in compliance with our rules and regulations. Failure to submit samples will result in a violation of the district’s rules and regulations.

Important things to remember:
- All active wells in Zone 5 must be sampled
- Commingled wells need to be sampled individually.
- Follow sampling instructions, especially the time frame for delivery.
- If there are multiple wells per quarter, be specific when labelling – sub-quarter or physical location description is helpful to assign results and therefore, comply with rules and regulations.

The Upper Big Blue NRD is now utilizing database software that will allow staff to better track reporting information, such as phase reports, sensor reports, and water samples. During this next three-year cycle, Zone 5 wells that have not been sampled by April 1, 2023, will be found in violation of district rules and regulations.

Legend
- Town
- Township
- Hastings Management Area

Upper Big Blue NRDNatural Resources District BluePrint

Upper Big Blue NRDNatural Resources District BluePrint
In the event of groundwater use allocation, the NRD’s Rule 5 allows pooling of irrigated acres. Pooling is a process that combines large numbers of irrigated acres (multiple parcels of land), so that landowners and operators can average water withdrawal over the combined acres. In an allocation event, pooling can help farmers optimize allocated groundwater use for each parcel of land within a pool. Pooling has been used internally to calculate average water use throughout the district for several years. Average water use for a pool is calculated by dividing total water use (for parcels within a pool) by total number of acres within a pool. This formula determines inches applied per acre.

Recently, the Upper Big Blue NRD has partnered with firms Olsson and Sitka Technology Group to develop a Water Accounting Platform software. The software will integrate pooling principles with an interface that makes water use come to life spatially. This platform will allow operators and the district to make better water management decisions.

Pools can be calculated by three methods:

- **Owner-Operator Pool:** Same owner and same operator for a group of tracts (parcels)

  Owner-Operator pools are the default pool for all parcels. Any tract belonging to the same individual landowner and farmed by the same individual operator is pooled if the tract of land does not fall into any other types of pools. Pool number is determined by combining a tract’s owner number with primary operator number. For example: Pool No. 1738-402. The owner number is “1738” and “402” is the operator number.

- **Well Pool:** Tract is irrigated by multiple wells. One or more of these wells irrigate more than one tract with different operator/ownership.

  When two or more tracts are irrigated by the same well, and there is a difference in either the owner or operator field of a tract, the tracts must be pooled. The pool number used will be the Well ID number. When a tract is irrigated by multiple wells and one or more of the wells irrigate other tracts with differing owners or operators, all tracts must be included in the same well pool. The lowest ascending well ID number that required the pool becomes the well pool number.

- **Agreement Pool:** Until an allocation is in place, agreement pools are not necessary. An agreement pool allows the owners and operators to pool tracts together based on written agreement. This could include combining tracts with multiple owners and one operator or splitting a tract when there are two or more operators and wells.

**Variable Rate Irrigation**

Want to add VRI in your operation? The Upper Big Blue NRD can help! We offer cost-share funding for EC mapping, prescription writing and panel upgrades. We will also cost-share on new VRI center pivot systems. Call your local NRCS office to learn more and get started!
Fertigation: Lower Risk, Higher Yields

Improved efficiency, cost savings, increased yields, and decreased environmental impact—there are many benefits to changing from fall and spring applied anhydrous to in-season fertigation.

Fertigation uses a center pivot or subsurface drip irrigation system to apply fertilizer to growing crops. Typically, when producers add fertilizer in fall and spring, they put on 10-20 percent extra to account for some leaching that will occur prior to plant uptake. With fertigation, the cost of that extra fertilizer is removed. Producers can add N based on crop needs and growth stage. This method can increase yields as plants are spoon-fed the right amount of fertilizer at the right time.

Fertigation can reduce the risk of lost investment in fertilizer if a natural disaster, such as hail or flooding, wipes out part of the crop. It can also be a labor-saver, as a producer doesn’t have to go over a field multiple times with equipment.

Many co-ops incentivize fertigation by assisting producers by supplying equipment and expertise, says Dan Leininger, water conservationist with the NRD.

There is a real impact on the High Plains Aquifer with this practice as well. If more producers used fertigation instead of fall and spring applied anhydrous, there would be less leaching into the aquifer, which means less nitrate in the drinking water.

Perhaps the most compelling reason to implement fertigation is the increased yield. In visiting with growers that use the practice in their operations, water technicians at the Upper Big Blue NRD say that producers have noticed an increase in crop yields.

“A lot of growers appreciate having another tool in their toolbox in case mid-season tissue samples show that they are lacking a certain nutrient,” said Leininger. “Fertigation offers precision and flexibility through split applications.”

In recent years, the district has seen an increase in the number of chemigation/fertigation permits. To apply for a permit, please call the NRD office at (402) 362-6601.

Irrigators...

It’s time to check your flow meter!

Be sure to check that your flow meters are functioning properly before you start irrigating. A properly functioning meter should not have condensation inside. Some flow meters are eligible for repair cost-share. Call the office at (402) 362-6601 to get started!
NRD Staff Additions

Rodney Verhoeff joined the staff as the new assistant general manager in June. Verhoeff’s resume is impressive, listing more than 15 years of project and program management in government, corporate, academic and non-profit settings. He has worked with Nebraska’s NRDs in a variety of capacities, including interagency watershed management and environmental sciences. He holds a bachelor’s degree in natural resources and a master’s degree in agronomy, both from UNL. For the past three years, he has served as a senior program manager and instructor at Creighton University’s Heider College of Business. He also works as a business consultant, providing clients with needs assessment, strategic planning, grant writing, business process analysis, project management system development, business intelligence and decision management, and organizational development through training and business coaching.

Mick Northrop’s talents and experiences as a facilities manager made him the perfect candidate for a new position of lead maintenance worker at the NRD. In this role, Northrop will oversee the NRD’s physical headquarters in York as well as the NRD’s five recreation areas. He will also maintain the NRD fleet and equipment. Northrop’s previous experience includes seven years as the Adams Central Public Schools facilities manager and 28 years with Perennial Public Power District in customer service, marketing and communications.

Jacob Maslonka, a 2018 UNL grad with a bachelor’s degree in fisheries and wildlife, has joined the NRD as a water resources technician. Maslonka’s previous work experience is rather exotic by Nebraska standards: he spent more than a year working in the Bering Sea as a North Pacific groundfish observer. In this role, he collected data about the composition of hauls brought up on fishing boats to determine species health. Prior experiences also include working as a research assistant for the UNL Agronomy and Horticulture Department and as an intern for the Lower Platte North NRD. At the Upper Big Blue NRD, Maslonka will be responsible for well inspections, electronic flow meters meter inspections and battery replacement, and water quality sampling.

Stop Uncontrolled Runoff

It is illegal to operate an irrigation system that contributes to wasting groundwater. State law prohibits uncontrolled irrigation runoff. The NRD is responsible for enforcement of this law.

Need help controlling irrigation runoff on your land? As part of the NRD Land Treatment Program, you can access cost-share funds to improve your irrigation system through sub-surface drip or VRI. Technical assistance is available from the NRCS for solving runoff problems. For more information contact your county NRCS office or call us at (402)362-6601.
Through an agreement with the Nebraska Department of Environment and Energy, and the guidance of JEO Consulting Group, the Upper Big Blue Natural Resources District completed a Water Quality Management Plan (WQMP) to serve as a road map to improve the water resources and water quality within the district. The WQMP utilized a technical advisory committee and a stakeholder advisory group to identify surface water and groundwater quality issues and to select target areas to focus implementation activities.

Two segments of Beaver Creek were identified as priority waterbodies, which resulted in the entire Beaver Creek drainage area being named as a single target area. The impairment focus of the Beaver Creek target area is atrazine. The Recharge Lake drainage area (located within the Beaver Creek target area), was also identified as a priority area. The impairment focus of the Recharge Lake target area is nutrients.

The WQMP was reviewed and accepted by the Environmental Protection Agency’s Region 7 in March of 2020. The EPA’s approval of the WQMP makes the district eligible for federal funding through the Clean Water Act, Section 319, Nonpoint Source Management Program.

Funding from Section 319 supports a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects and monitoring to assess the success of specific nonpoint source implementation projects.

District-wide and target area implementation efforts will address sediment, nutrients, bacteria, and atrazine, primarily through existing programs administered by the district, NRCS, and other partners. These programs will provide technical and financial assistance for identified best management practices to landowners and producers.

The next step will be to form a target area stakeholder group comprised of landowners, producers, and other interests located within the two priority areas. This stakeholder group will be tasked with identifying and prioritizing implementation practices that will be supported by landowners within the targeted areas. These recommendations will be used to apply for Section 319 funding to get best management practices going on the ground. These efforts will assist the district in meeting the WQMP vision of locally managed water resources, in cooperation with partners and stakeholders, through conservation, protection, and responsible development for the health and welfare of the people of the district.
Project GROW: 2020 Season Update

At the Project GROW demonstration fields in York, things are off to a great start for the new growing season. Both the north and south fields were planted to rye last fall. The north field will be harvested for rye seed in late June or early July and has been contracted to Green Cover Seed in Bladen, Nebraska. Immediately after the rye has been harvested, a cover crop will be planted using a no-till drill. The cover crop will be grazed by cattle starting some time in September for about 30 days. After the cattle are moved, an additional cover crop will be planted to protect the soil, feed soil biology, and produce soil carbon.

The south field will be “planted green,” as soybeans will be planted into the still-growing rye. This gives the soil the added benefit of extra carbon production from the rye for several more days prior to termination.

Before the rye is terminated, samples will be taken to be sent to a lab to determine how much residual nitrogen from the previous corn crop was taken up by the cover crop and stored in the above ground biomass. Like the north field, a cover crop will be planted in the south field after the soybeans are harvested in the fall. “We haven’t yet determined the type of cover crops to be used on both fields in the fall,” says Dan Leininger, water conservationist. “We will plant a cover crop specific to the needs of the field once we determine what the cash crops will be in 2021.”

For more information, visit www.upperbigblue.org/projectgrow.

Triticale crop at Project GROW in 2018
The NRD board of directors has approved funding for two Educational Capital Projects Fund requests. The first is a $1,000 grant for Osceola High School for the purchase of equipment to be used to expand their FFA chapter’s Blue Jackets, Green Thumbs program. This program includes hands-on learning via a school farm, community garden, and greenhouse.

The food that students grow is distributed locally through a variety of channels. In the future, they hope to provide meat and produce to be served in the school cafeteria. The grant from the NRD will purchase a tiller for prepping the soil in the garden area and a supply of potting soil for starting plants in the school’s greenhouse. These starts will be transferred to the garden each spring and students will tend the garden through the summer and fall.

A grant of $1,200 was awarded to Centennial High School in Utica for the purchase of equipment to launch the Citizen Scientist Pilot Program. This program, under the guidance of science teacher Rebecca Vossler, will engage students in local water quality testing and reporting. The NRD grant will combine with grant funds from other entities to purchase a HACH spectrophotometer and additional materials needed for collecting and testing water samples. Vossler and students from her environmental science class got a head start on the project earlier this spring by testing water samples from private wells around Utica in the NRD lab in York.

“We are excited to start the Citizen Scientist Pilot Project next spring,” said Vossler. “The kids are looking forward to getting out into the surrounding areas in our district to sample water.” Vossler’s students will inform homeowners who have water samples that test high in nitrates, so that the program will benefit the whole community.

**Burke Scholars**

Each spring the NRD board selects two recipients to receive Raymond A. Burke Scholarships. These awards in the amount of $2,000 are designated for district residents who are full-time students pursuing a two-year or four-year degree at a Nebraska college or university. Recipients must be enrolled in a natural resources program or related field and intend to enter the workforce upon graduation in a hands-on position such as farmer, conservationist, land manager, ag educator, or engineering technician.

The board has named Benjamin Janssen of Marquette and Kaitlyn Fehlhafer of Utica as the 2020 recipients of Burke scholarships.

Ben is the son of Steve and Donna Janssen. A 2019 graduate of Nebraska Christian High School, Ben participated in many leadership and extracurricular activities, as well as maintained an excellent GPA. He has just completed his freshman year at UNL where he is currently pursuing a degree in horticulture with a specialty crop option. He is also interested in plant biology, ecology, and management. He is passionate about the conservation of Nebraska’s native plants and natural landscapes. His career goals include working in plant science, prairie restoration, and natural resource management in Nebraska.

Kaitlyn is the daughter of Steve and Kara Fehlhafer of Utica. She graduated from Centennial High School this spring and will continue her education at UNL in the fall, where she plans to major in wildlife and fisheries management. Her goal is to work with farmers and other Nebraskans to raise awareness about the importance of wetlands. Future plans include owning a land consulting business, helping Nebraskans manage hunting grounds and wetlands. Kaitlyn has been involved in FFA and National Honor Society, as well as many other extracurricular activities. For more information visit www.upperbigblue.org/education.