

**Blue River Compact (BBRC) Annual Meeting
 Blue River Compact Report - Upper Big Blue NRD (UBBNRD)
 Terry Julesgard, Water Department Manager
 Jack Wergin, Projects Department Manager
 May 9, 2023**

Well Drilling Activities

Sixty-six permits were issued for irrigation and livestock wells (37 new & 29 replacements) during the 2022 calendar year. In January 2023, there were 12,223 irrigation wells in the District.

Groundwater Level Changes

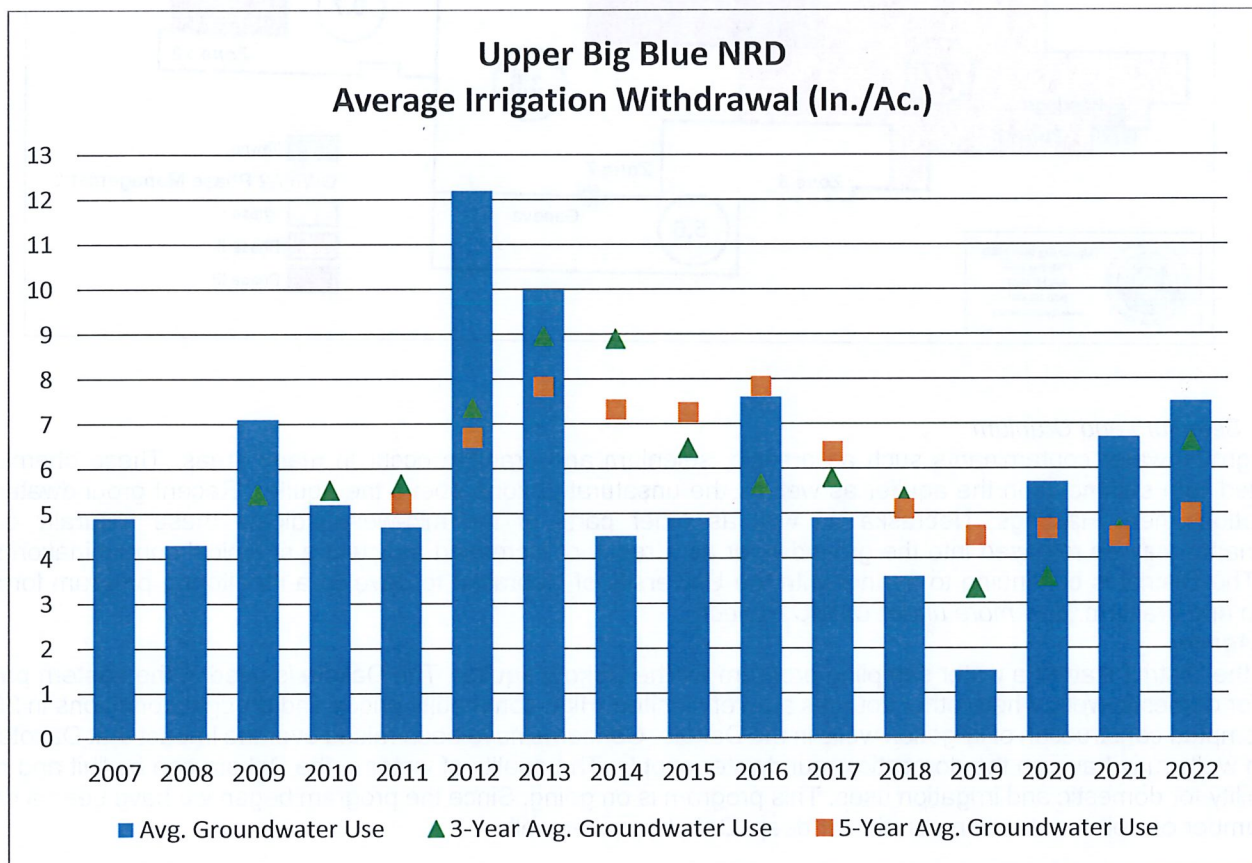
The average groundwater level change for the District from spring 2022 to spring 2023 was a decline of -2.21 feet. The spring 2023 groundwater level is 6.68 feet above the District's allocation trigger level.

Certified Irrigated Acres

Mandatory reporting of irrigated acres and other water uses began in 2006. As of January 1, 2023, there were 1,244,830 groundwater irrigated acres certified by the NRD. This represents an increase of 967 acres since January 1, 2022.

Groundwater Withdrawal

Mandatory reporting of groundwater withdrawal began in 2007. 2022 was the 15th year that groundwater withdrawal reports were required in the District. Metering became mandatory on all wells effective January 1, 2016. The staff has inventoried all flowmeter installations and are now conducting routine inspections as needed. The average groundwater withdrawal for irrigation in 2022 was 7.53 inches per acre. The graph below shows the average annual withdrawal for irrigation over the past fifteen years.

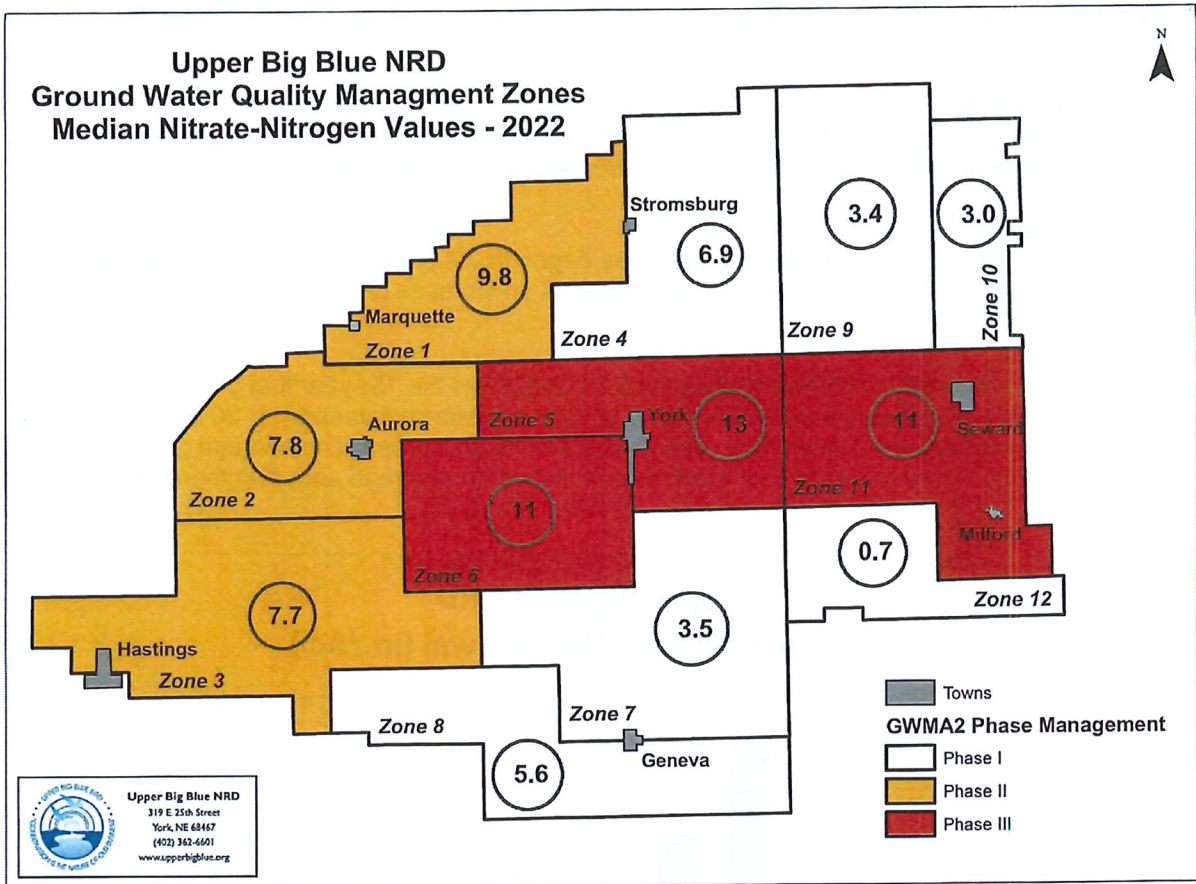


Groundwater Quality

Nitrate

The District is divided into twelve management zones for groundwater quality management. The primary groundwater quality management concern is nitrate. Three zones (1, 2, and 3) are currently designated Phase II Management Areas and three (Zone 5, 6, and 11) designated as Phase III Management Area. Phase II & III Management Areas require farm operators to attend a training session on best management practices related to fertilizer and irrigation management. It also requires deep

soil sampling, irrigation scheduling and annual BMP reports. Farm operators in Phase II & III must schedule irrigation using soil moisture sensors in at least one field. In a Phase III Management Zone anhydrous ammonia fertilizer applied from November 1st through February 29th must include a nitrification inhibitor. The timing of application of nitrogen fertilizers is restricted District wide. There are currently over 1,147 farm operators in the District required to attend nitrogen management training. The District is also working with the City of Hastings and the Little Blue NRD on a special water quality management area to address nitrate contamination in the Hastings Wellhead Protection Area.



Arsenic, Selenium and Uranium

Natural groundwater contaminants such as arsenic, selenium and uranium occur in many areas. These chemicals are associated with sediments in the aquifer as well as the unsaturated zone above the aquifer. Recent groundwater quality investigations near Hastings, Nebraska as well as other parts of the mid-west indicate these naturally occurring contaminants may be released into the groundwater as a result of increased agriculture chemical contamination such as nitrate. The District is continuing to partner with the University of Nebraska to develop a monitoring program for arsenic, selenium and uranium. See more under UNMC Project.

Dakota Aquifer

In 2016 the District started a water sampling program for the Dakota aquifer. The Dakota is used in the eastern part of the District for domestic wells where other sources are very limited. High commodity prices and drought conditions in 2012 and 2013 prompted construction of irrigation wells in the Dakota. Concerns have been raised over the impact that Dakota aquifer irrigation wells may have on the domestic groundwater supply. The quality of water in the Dakota can be "hit and miss" as to suitability for domestic and irrigation uses. This program is on going. Since the program began we have seen a decrease in the number of well construction permits for deep, Dakota aquifer wells.

University of Nebraska Medical Center (UNMC) Project

Over a minimum of two years, the District, in partnership with UNMC, will periodically collect drinking water samples to determine seasonal variability in contaminant concentrations which may be impacted by fluctuations in the water table due to irrigation. Samples were taken in April/May (pre-irrigation), June/July (during irrigation) and October/November (after irrigation) at up to 50 locations selected on the basis of proximity to known cases of pediatric cancer and the willingness of the homeowner to provide access to collect seasonal samples. Along with the collection of samples a survey was taken to learn about the occupants, well history, well construction if known, and any radon measurements collected in the home. UNMC will evaluate the water samples for conventional water quality parameters (conductivity, solids, pH, etc.) as well as nitrate, atrazine, arsenic, uranium and uranium decay products.

The first sample collection took place in the fall of 2021, followed by the spring, summer and fall of 2022. District staff are currently coordinating for the next spring sampling event.

Project Grow

Project GROW is a collaborative demonstration project between the City of York and the UBBNRD. It focuses on three areas of interest: a soil health demonstration, an awareness of the importance of pollinator habitat and a community garden for the citizens of York. The District is farming 140 acres of the City wellfield with crop rotation which includes cover crops and alfalfa to promote soil health. This is the sixth growing season, and the first of a second five-year interlocal agreement for the project. Not only is the District seeing success in GROW, but the City and citizens are taking notice of our work to protect groundwater quality, promote soil health practices, all while maintaining profitability.

The Nature Conservancy Cover Crop Interseeding Project

The UBBNRD, the Nature Conservancy, and University of Nebraska Extension have partnered on a project demonstrating soil health/sustainable agriculture practices. The partners worked with local producers from all corners of the District to interseed cover crops into growing cash crops to improve soil organic matter, increase water infiltration, provide weed suppression, and to improve overall soil health. In 2022, ten producers participated in this demonstration. We completed year three of this three-year project. The Nature Conservancy, and their partners, were the primary funding source for this project. The project partners agreed this is a valuable project and have transfer the ownership of the equipment to the District. The District will continue to promote soil health by make the interseeder available to producer who want to test this practice on their own land.

Nebraska Agricultural Water Management Demonstration Network

This program encourages producers to improve irrigation scheduling using Etagages and Watermark sensors to determine crop water needs. This program began in the UBBNRD in 2005 with a collaborative effort with the University of Nebraska Extension and 18 collaborators. The program is now being implemented in several NRDs and coordination has been taken over by the University of Nebraska. The District still sells this equipment to irrigators at a reduced cost to encourage adoption of irrigation scheduling practices.

Groundwater Modeling

The District, in cooperation with the Lower Big Blue, Little Blue, Tri-Basin NRDs and the Department of Natural Resources are partnering in the development of a transient Blue River Basin Groundwater Model that can not only answer the question of interconnection between surface and groundwater, but other management questions NRDs ask when reviewing their groundwater management plans. This project is wrapping up and should be completed by June 2023.

Source Water/Wellhead Protection Planning

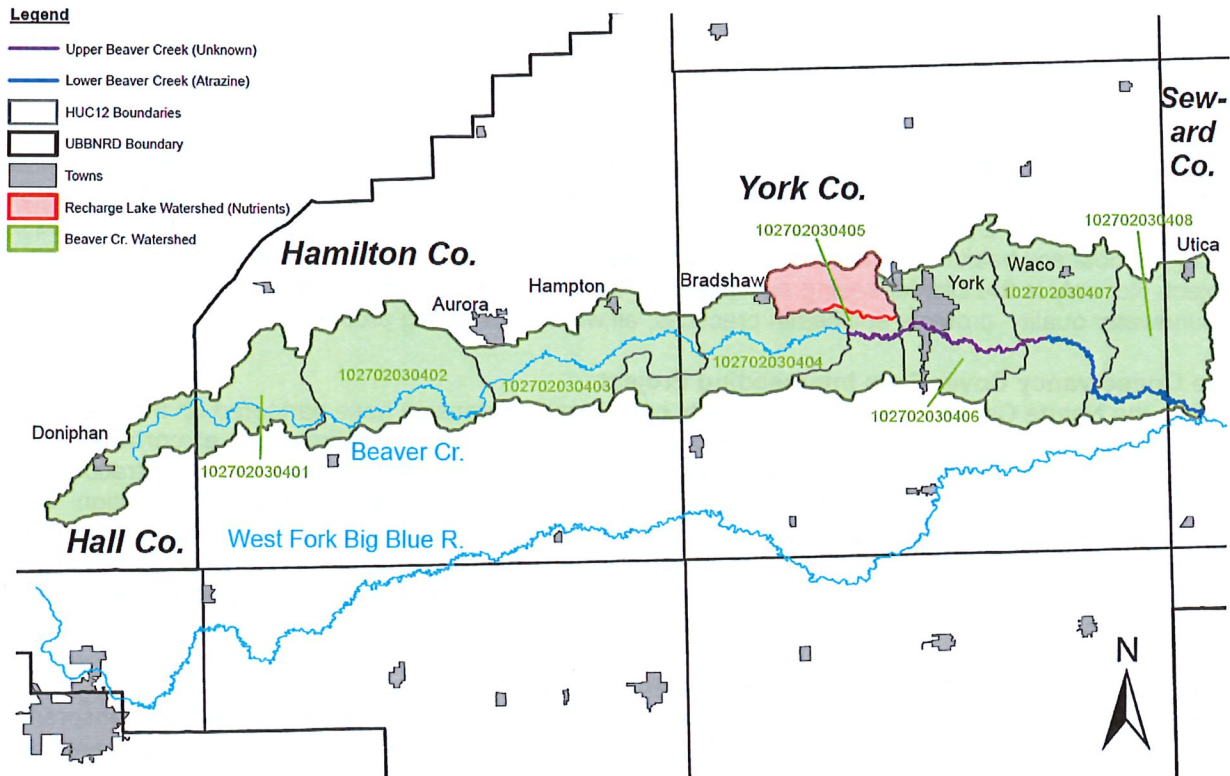
The District continues to partner with communities to develop Source Water/Wellhead Protection Area (WHP Area) Plans. The District also assists communities with implementation of some plan components. These include BMP incentives, water sample collection, analysis from rural wells, and soil samples collected from the unsaturated zone for nitrates.

GWMA#2 Vadose Zone Study

The District has partnered with the University of Nebraska Water Center to look at nitrate movement and groundwater recharge throughout the District. This project will focus on investigation of the vadose (unsaturated) zone and groundwater nitrate and agricultural contaminant occurrence and transport in the Upper Big Blue Natural Resources District (UBBNRD) using several shallow (15') and deep (to the top of the aquifer) soil samples collected from the water quality management zones. This is a four-year project which started the fall/winter of 2022.

Water Quality Management Plan

In March of 2020, the UBBNRD District Wide Water Quality Management Plan (WQMP) was accepted by Environmental Protection Agency (EPA) and the UBBNRD Board of Directors. The District completed Phase I of the WQMP process to further identify priority conservation practices utilizing a target area stakeholder group comprised of landowners and other interests from both the Recharge Lake and Beaver Creek watersheds. Similar to the NRD wide WQMP stakeholder group, the target area stakeholder group identified filter/buffer strips and cover crops as the most acceptable practices.



WQMP – Implementation Program

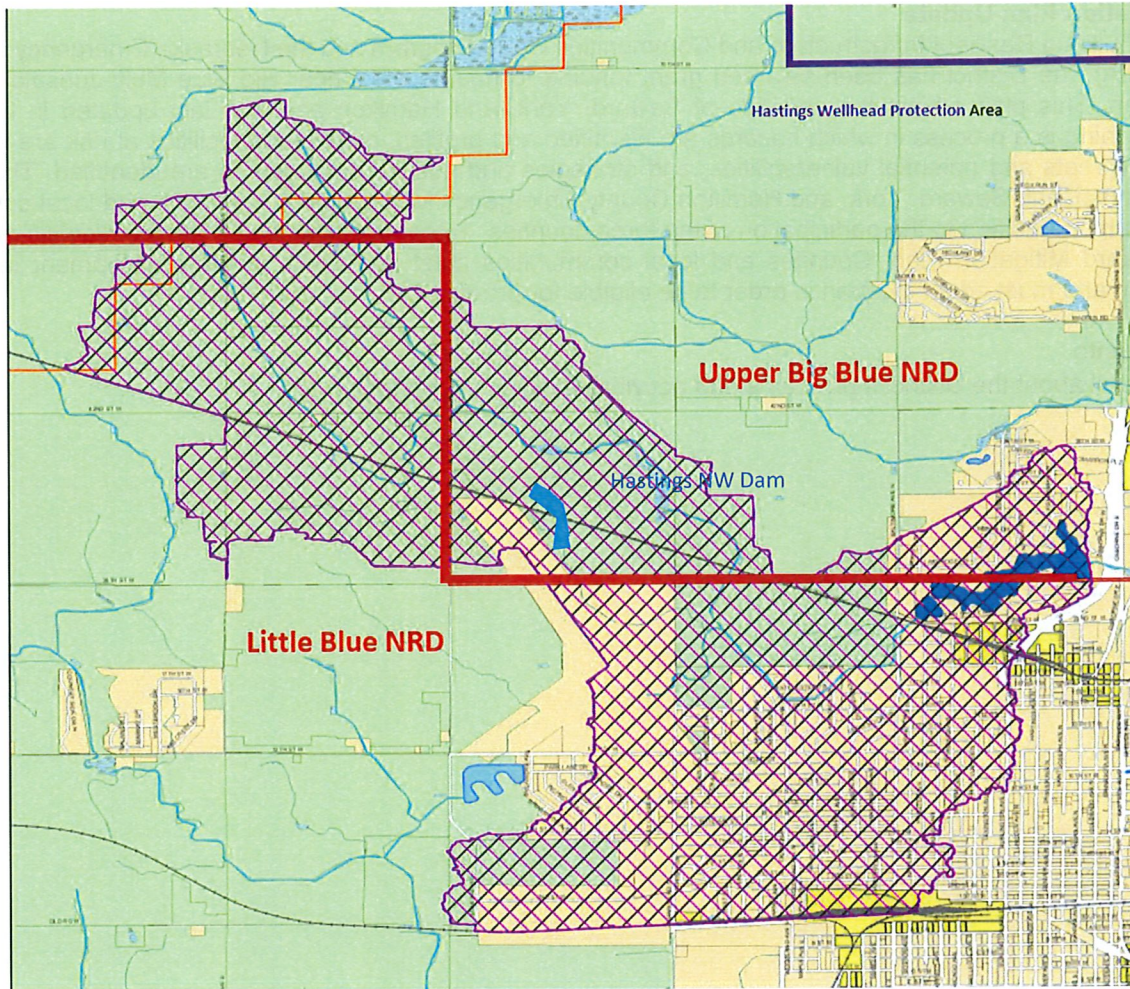
The Upper Big Blue NRD Board approved WQMP implementation programs that provide incentives for conservation practices in the priority areas. Initial programs utilized available NRD funding with plans to apply for the Clean Water Act Section 319 Grant funding as these programs develop.

The WQMP Cover Crop Program offers landowners cost share assistance to install cover crops in specific high-risk areas of the Beaver Creek watershed and within the well head protection areas of communities with approved wellhead protection plans. High risk areas were identified using the Agricultural Conservation Planning Framework (ACPF) program which identifies very high risk and high-risk areas based on topography and soil type. This program provides landowners with a tiered cost share with a 5-year commitment. The District also offers a 50% annual incentive payment (over the Nebraska Buffer Strip Program Rate) for new or re-newed buffer strip contracts within the Beaver Creek watershed. In addition, the District offers an increased cost share rate and maximum funding assistance limit for land treatment projects within the high-risk areas of the Beaver Creek watershed.

Lake Hastings – Water Quality Management Plan

The City of Hastings, the Little Blue NRD, and the Upper Big Blue NRD are working together to address sediment and pollutants in Lake Hastings. Through a contract with JEO Consulting and a Grant from the Nebraska Department of Environment and Energy and Region VII Office of the U.S. Environmental Protection Agency, a Lake Hastings Watershed Management Plan will be developed and added to the Upper Big Blue NRD's District Wide Water Quality Management Plan. A local stakeholder group will be selected to study existing conditions and contributing causes, as well as identify best management practices (BMPs) that will improve conditions in the watershed.

Lake Hastings Watershed CITY OF HASTINGS, NE



Resource Conservation Partnership Program (RCPP)

In 2020, the Nature Conservancy was awarded RCPP funds for the 'Nebraska Soil Carbon Project'. The project is a collaboration with the Natural Resources Conservation Service, Upper Big Blue NRD, Central Platte NRD, Ecosystem Services Market Consortium, Cargill, Target, and McDonald's. The goal is to partner with 100 producers to install soil health practices on 100,000 acres of central Nebraska cropland over five years. Farmers who enroll will be compensated for adopting cover crops, no-till, and/or diverse rotations. For the second enrollment period, NRCS has offered 12 contracts to farmers for a total cost of \$639,236.34. We are still awaiting confirmation on which farmers have accepted the contracts.

Nebraska Buffer Strip Program

Through the Nebraska Department of Agriculture, the District administers the Nebraska Buffer Strip Program. This program provides cost share funds for landowners to establish vegetative buffer strips along shorelines of wetlands, streams, and lakes. Funding comes from a fee assessed on all pesticides registered for use in Nebraska. In FY2023 the District administered 26 buffer strip contracts which provided a total cost share of \$31,322.04.

Private Dams Program

Through District's Private Dams Program, the District provides planning, design, and financial assistance for the construction or reconstruction of dams located on private property. In FY2023 the District is providing cost share assistance for 4 dams with a total \$163,620.06 of District funds. Through the first seven years of the program the District has provided assistance for 20 dams with an average cost share of \$27,200 per dam.

NRD Recreation Area Warning Sirens

Working with the Nebraska Emergency Management Agency and local county emergency management agencies, the District has received Hazard Mitigation Grant Program funds to install warning sirens at four of the NRD's recreation areas. Through this assistance, warning sirens will be installed at Pioneer Trails Recreation Area near Aurora, Bruce Anderson Recreation Area near York, Smith Creek Recreation area south of Utica, and Oxbow Trail Recreation Area near Ulysses.

Siren installations will be coordinated with the Hamilton, York, Seward, and Butler County Emergency Management Agencies.

Hazard Mitigation Plan Update

Through the Building Resilient Infrastructure and Communities Grant Program and the Nebraska Emergency Management Agency (NEMA), the District has been awarded grant funding to update the Upper Big Blue Multi-Jurisdictional Hazard Mitigation Plan. This plan covers the counties of Seward, York, and Hamilton and was last updated in 2019. Hazard mitigation planning is a process in which hazards are identified and profiled, people and facilities at risk are identified and assessed for threats and potential vulnerabilities, and strategies and mitigation measures are identified. The District will work with a consultant, Seward, York, and Hamilton County Emergency Management Agencies, and local communities to update this plan. In addition to the participation of the three counties, 25 communities and 3 special districts participated in the 2019 Hazard Mitigation Plan. Counties and local communities must participate in the development in the Hazard Mitigation Plan and must adopt the plan in order to be eligible for pre-disaster mitigation funds.

Visit our Website

You can learn all about the District's programs and activities at www.upperbigblue.org.