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HEARING ON THE HIGH PLAINS: COMBATING DROUGHT WITH INNOVATION

HEARING

BEFORE THE

SUBCOMMITTEE ON
CONSERVATION, CLIMATE, FORESTRY, AND
NATURAL RESOURCES

OF THE

COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY

UNITED STATES SENATE

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SECOND SESSION

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C O N T E N T S

Wednesday, June 26, 2024

HEARING ON THE HIGH PLAINS: COMBATING DROUGHT WITH INNOVATION

Wednesday, June 26, 2024

U.S. SENATE

Subcommittee on Conservation, Climate, Forestry, and Natural Resources

COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY

Washington, DC.

The subcommittee met, pursuant to notice, at 9 a.m., Mountain Standard Time, at the Midway Theater, 446 14th Street, Burlington, Colorado 80807, Hon. Michael F. Bennet, Chairman of the Subcommittee, presiding.

Present: Senators Bennet [presiding] and Marshall.

STATEMENT OF HON. MICHAEL F. BENNET, U.S. SENATOR FROM THE STATE OF COLORADO

Senator BENNET. Good morning, everyone. I am very grateful that you are here. I am sorry that we are starting a few minutes late. Cindy, thank you very much for taking care of all this and your—and your colleagues as well from the Agriculture Committee, but we got both Wi-Fi back and the air conditioning, so we appreciate it very much.

I am pleased to have the chance to call this Subcommittee hearing on Conservation Climate, Forestry, and Natural Resources to order, and especially to welcome all of you to Burlington, Colorado. I am extremely grateful to my colleague, Ranking Member Roger Marshall, for his partnership in convening today's field hearing, and I would like to thank his staff, Tucker, and my staff, Rosie, for their excellent collaboration in getting us here this morning. I know Senator Marshall shares my concern about the unprecedented drought that farmers and ranchers throughout the Western United States are enduring, and he has been an outstanding bipartisan partner in the work that we have been doing on the Agriculture Committee.

I want to thank the Agriculture Committee staff who have traveled here to ensure that our hearing on the High Plains runs just as smoothly, maybe even more so than it would in a hearing room in Washington. In fairness to all of us, we do not have some of the cast of characters that we have in Washington, DC to screw things up today.

[Laughter.]

Senator BENNET. I also want to thank all of the Colorado State University staff for their support, our Hometown Charitable Foundation for hosting us at the Historic Midway Theater, the city of

Burlington for welcoming our attendees from near and far, and all of our witnesses today.

Senator BENNET. Well, I am glad to live in a country where people can speak freely.

Senator MARSHALL. Amen.

[Applause.]

Senator BENNET. It is one of the great things about being in the United States. I also should say—I did not say at the beginning how nervous I am about interrupting wheat harvest today.

[Laughter.]

Senator BENNET. I think Senator Marshall joins me in saying, if you need to leave, you need to leave, and please do not worry about it, but we look forward to the witness' testimony today. Many hands go into making a successful field hearing happen, and I am grateful to all of you.

Our purpose today is simple and straightforward. It is to hear directly from Western producers who are facing unprecedented challenges of a—of a hotter, drier landscape and using innovative tools to combat historic drought. There is no more appropriate place to talk about this issue than Burlington. During the Dust Bowl, devastating dust storms plagued farmers here in Kit Carson County. Black dust, blanketed roads, suffocated livestock, destroyed crops, and ruin the livelihoods of thousands of Eastern Coloradans and Western Kansans who took generations to recover. I was grateful to spend yesterday in Kansas yesterday afternoon visiting with a—with a farmer there and his family who are wrestling with the effects of drought.

That was a terrible time for American agriculture, and out of desperation, farmers and ranchers put subpar land into production. They were told that rain would follow the plow as they struggled to feed their families. This made America's working lands vulnerable to dust storms that ravaged our heartland. Prairie winds blew 50 million tons of topsoil off the Southern Plains in 1935 alone, and after that—some of that dirt land—and dust landed on the U.S. Capitol, Congress finally recognized the crisis on the Eastern Plains by creating the Soil Conservation Service, which has since become the Natural Resources Conservation Service, or NRCS. For almost 90 years, NRCS has partnered with farmers and ranchers and private landowners to protect our farms and safeguard our natural resources. The Farm Service Agency also plays a critical role mitigating the effects of drought and managing agricultural land from the Conservation Reserve Program to crop and livestock disaster programs that are so important to our producers. Today, their mission has never been more important as we confront a change in climate and a hotter, drier future.

These programs have not kept pace with a West that looks very different from the Dust Bowl era. I hear from producers across the State that NRCS and FSA programs need to be much more flexible and allow for more innovation but, instead, are burdened by red tape. The applications are cumbersome, as we heard yesterday, only accepted during short enrollment windows, and USDA takes too long to process them. In some cases, people have to literally fill out their applications by hand and send them in by mail in 2024.

Many of you likely knew Pat O'Toole, the cattle and sheep rancher, whose family's sixth-generation operation straddles the Colorado-Wyoming border. He and his wife, Sharon, manage their ranch with future generations in mind.

[Applause.]

[Pause.]

Senator BENNET. Pat O'Toole is not an animal killer or a planet killer. He and his wife, Sharon, manage the ranch with future generations in mind every single day. Before Pat's recent passing, he was in the middle of preserving the family's ranch through a USDA agricultural conservation easement. That easement had been in the back-and-forth process with NRCS since November 2020, and Pat, sadly, was unable to see his family's ranch protected before his passing in February this year.

Federal red tape is especially tough on young farmers, small-scale producers, underserved and first-generation farmers. They do not have the time—nobody does—to navigate the bureaucracy and cannot afford to hire someone to do it for them. The future of rural America depends on whether the next generation decides to continue operating their family farms and ranches.

Today, we are going to hear from experts, producers, and partners who, like Senator Marshall and I, are concerned for the future of rural America. They will highlight their experience with drought and a rapidly changing landscape. They will tell us about the Federal programs that work well, and they will tell us about the programs that are not working for farmers and ranchers, especially those east of the Mississippi River. We will also hear from producers who are breaking tradition with how their grandparents or parents once farmed and pioneering practices to grow food and fiber for the rest of us.

To underscore the issues of drought affecting agricultural—American agriculture, I have a map of the current U.S. Drought Monitor and testimony from the national Association of Wheat Growers, the Colorado Wheat Growers Association, and American Rivers that is describing the situation we face.

I ask unanimous consent that they be entered into the record. So moved.

[The documents can be found on pages 156–165 in the appendix.]

Senator BENNET. That is the good thing about being chairman of a subcommittee. When I do that in DC, I have to get the attention of the chair.

Instead of a dust bowl, today's farmers and ranchers are dealing with a 1,200-year drought. They face a change in climate and a future that is going to get hotter and drier. As we meet today, more than half the country is in the throes of a historic heat wave with wildfires raging across the West. We do not have time to waste. This is a five-alarm fire, and Washington needs to treat it that way. My hope is that today's hearing can help us identify specific ways to make progress, and I am prepared to work with every member of the Agriculture Committee in a bipartisan way to do so.

So now let me stop there and I will turn it over again to the ranking member, Senator Marshall from Kansas, who is good to make the trip over here. As we talked about yesterday, the border between Colorado and Kansas does not really recognize distinctions

in drought or in the challenges that our producers are facing. I cannot think of a more appropriate person to be here to have this conversation with than Senator Roger Marshall. Please give him a round of applause for making the trip. Thanks.

[Applause.]

STATEMENT OF HON. ROGER MARSHALL, U.S. SENATOR FROM THE STATE OF KANSAS

Senator MARSHALL. Well, Senator Bennet, it is a great honor to be up here with you. I appreciate your hospitality.

Senator MARSHALL. Well, like I was saying, Senator Bennet, it is an honor to be here with you. I want to thank you, Rosie, you and your staff. I know that you—the staff really does all the work as well, so thank you. Recent marriage, is that right?

[VOICE.] Yes.

Senator MARSHALL. A recent—so she is on her honeymoon here.

Senator BENNET. This is her honeymoon.

[Applause.]

Senator MARSHALL. Welcome to our witnesses. Thanks to my staff. Tucker Stewart is behind me, our ag person, and Katie Sawyers out there is our State director. Thanks for making this all possible.

On a personal basis, Senator Bennet, it is—it is an honor to just not call you a colleague but a friend. To tell a story on both of us, we work out together about every afternoon when we are back in DC, and it is an interesting place, the Senate gym. Before you think—get your eyes off in too much of a—of a mindset, what this looks like, this is worse than any YMCA I have ever been in. It is, but I love it. I love the gym. We let our guards down, and I can attest that there is probably nobody in better aerobic shape than Senator Michael Bennet. I mean, he works at it hard on this—on this biking business, so I appreciate that about him as well.

I would just assure people in the audience and the folks that are watching from home is that there is no one more committed to leaving this world cleaner, healthier, and safer than we found it than the two of us, and it is in our heart. It is in our soul. This is a priority we think about future generations, why we are—we are in the Senate, came to Congress. This would be one of my three things that I would like to leave a mark on before we leave, so very, very important to me.

You—and you are about the similarities between the State, that in so many ways, Eastern Colorado looks like Western Kansas, and it is no surprise that once upon a time, we are sitting in Kansas territory. Just want to remind everybody of that——

[Laughter.]

Senator MARSHALL [continuing]. that this was Kansas territory once upon a time, but we do share much more than a borderer. We share this drought. For about 10 of the last 15 years, we have shared this drought. Many parts of my State, your State are a year's worth of moisture behind. In the last 5 years, we have lost a year's worth of moisture, and we continue to struggle, and that I believe that water is—will be the defining issue of our States for not just the near future, but for generations ahead, and not just for agriculture, but for municipalities as well. This is the defining

issue, water conservation. It is the most valuable commodity that our Nation is blessed with.

I think for the folks that are listening back in DC, it is so important to understand what this aquifer is and how important it is to American agriculture as we continue to feed and clothe the world, that this aquifer is like an ocean beneath us. If you would go down about 400 to 500 feet beneath the ground where we are sitting today, there is an ocean of fresh water, and it goes from South Dakota through Nebraska, Kansas, Oklahoma, Texas, New Mexico, Colorado, and Wyoming. In some places it is a hundred foot deep, some places it is a thousand foot deep, and the rate of going down is faster than we have replenished it, but we have slowed down that deplenishment thanks to conservation practices. We visited a farm yesterday where they basically are at net neutral now. By conservation practices alone, they are now at a neutral use of that water, and I think that is what we are here to accentuate today.

As you mentioned, 90 years ago, the Dust Bowl ravaged our corner of the world, and my great-great-great grandparents were starting family farms across the State of Kansas and building terraces, trying to figure out how to conserve this land. We have had some spring rains that have provided some moisture, but we still have this effect of this drought going on, and we are not close to being out of the woods. We do not know what the summer holds. We do not know what the fall holds. We do not know what next year holds. Providing a value perspective on this area are some of Kansas' and Colorado's brightest minds, who I am excited to have here today and to listen and learn. There has been a great public-private partnership between agriculture producers and the Federal Government, and we have created the strongest food system in the world. We are so blessed.

Food security is national security. We are so blessed that we are not dependent upon other countries to feed us, but many countries are dependent upon us to help feed them.

In Washington, DC, many lawmakers and agency staff may be unfamiliar with the type of challenges our farmers and ranchers face on these High Plains. In fact, Kansas and Colorado only qualified for about 40 percent of the conservation practices through the IRA. Let say that again. Kansas and Colorado ranchers and farm producers only qualified for about 40 percent of the conservation through the IRA. We need some more flexibility, if at all possibility. Our farmers and ranchers want to do the right thing, but we need some flexibility.

These environmental practices were designed to cut carbon emissions, yet they cut out some of our country's highest crop-producing region, and in our Nation's second largest carbon sink: soil. We do not have the wonderful forest that Colorado has for a carbon sink, but the soil carbon sinks that we have in our States are just as important. I will give you an example of some of the environmental practices that we simply cannot do in Eastern Colorado or Western Kansas. Anyone that farms east of the 100th Meridian are getting paid by the Federal Government to grow cover crops, but the practice does not work out here. We simply do not have the moisture to do it. We would love to do cover crops, but we do not have the moisture, and that is why we need the flexibility. We have seen na-

tional disasters, drought, and wildfire. Farmers and ranchers need Federal assistance to maintain their livelihoods and continue producing our Nation's food supply. Unfortunately, the bureaucracy sometimes in DC delay the process, and we owe work to our producers to set up and improve and implement safety net mechanisms.

Senator Bennet, since I was a little kid raised on a farm, riding on a tractor, my grandparents spent time teaching me how important it was to leave our farm better for the next generation, and that is why I have said our farmers and ranchers, we are the original conservationists. Today we will explore the best ways to support them in the midst prolonged drought as the Federal Government—whether it is through improving conservation flexibilities, developing research opportunities, or strengthening disaster relief funding, I am confident that we will come out of today's field hearings with innovative solutions for farmers and ranchers in our corner of the country and beyond.

I think about this, that we are the descendants of those people that homesteaded out here, that they figured out ways to innovate and persevere and, through hard work, pass it on to future generations. I am confident we can do it, and, again, I am just so honored to be here to help you and empower us to help solve this problem. Thank you.

I have two witnesses I want to introduce today, and I think we introduce them all, and then they will give their testimoneys later. I am going to first introduce Chip Redmond. Chip, thank you for being here today. He was originally from Ohio, but we are now proud to call Chip a Kansan. He obtained a bachelor's degree from The Ohio University with minors in computer science and physics in 2011, and a master's from South Dakota School of Mines and Technology. For the last year, he has been the Kansas Mesonet manager in the Department of Agronomy for the Ever Fighting Kansas State Wildcats.

[Laughter.]

Senator MARSHALL. He works extensively with the Mesonet, a network of 80-plus weather stations in the State. He is also an incident meteorologist for Rocky Mountain Area, Complex Incident Management Team in the Kansas Forest Service, and finally, he is a volunteer, and one of my favorite loves, he is captain of the Blue Township Fire Department and assists in coaching his children's baseball/softball teams. He resides in beautiful—one of the most beautiful cities in Kansas, St. George, Kansas along—is the Blue River there? Kansas River there.

Then also, I am going to introduce Connie Owen. Connie is the director of Kansas Water Office, and prior to that, she served as the chair of the Kansas Water Authority. She is a licensed attorney and has practiced Kansas water law for over 25 years. In 2004, she served as the administrative hearing officer presiding over the initial hearings for the first two—something I am very proud of—the local enhanced management areas, which we refer to as LEMAs in Kansas. These programs help with water conservation in Kansas. She is a lifelong Kansan. She earned her bachelor's degree from The Emporia State University, the Fighting Hornets, and her law degree from the University of Kansas. Connie and her husband,

Dan, live in Overland Park and have two grown sons. Glad to have both of you here. Thank you.

Senator BENNET. Thank you very much, Senator. I like to introduce first Mr. Robert Sakata, who is an agricultural policy advisor for the Colorado Department of Agriculture and serves as president of Sakata Farms in Brighton, Colorado. Robert was born and raised in Colorado and grew up on his family farm, which his father started in 1944. Over time, his family farm successfully adapted to production pressures, including the decreasing availability of water, lack of adequate seasonal labor housing, which we have talked about a lot, increasing cost of crop inputs, and urban encroachment. In addition to his lifelong farming experience, Robert has served in a wide range of agricultural-and water-focused positions beyond his farm, including the Colorado Department of National Resources, Interbasin and Compact Committee, and the Colorado Water Conservation Board. I am grateful to have him with us at this hearing today. Robert, I look forward to your testimony.

Mr. Peter Goble is next, a climatologist for the Colorado Climate Center at Colorado State University. His responsibilities include supporting the Colorado Climate Center's three main missions of climate research, data collection, and education and outreach. His current research includes using machine learning to better understand errors in annual water supply forecasts in Colorado, modeling future weather extremes in Colorado, and using a mix of observed and model data to determine whether we can grow more wine grapes in Colorado. Peter, thank you for being here today. I look forward to your testimony as well.

Last but not least, Mr. Alexander Funk is the director of Water Resources and senior counsel for the Theodore Roosevelt Conservation Partnership. Alex has over a decade of experience working on the Colorado River and other Western water challenges. In his role with the TRCP, Alex leads the organization's national freshwater policy efforts, focusing on issues ranging from the Clean Water Act, to securing Federal funding, to increase watershed conservation and restoration projects benefiting fish and wildlife. Thank you for being here today, Alex. Thank you for making the trip. I look forward to your testimony.

Again, I want to thank all our witnesses for being here today. As a reminder, we ask you to keep your testimony to 5 minutes each. Any written testimony will be submitted for the record. You may hear me gavel should your time expire. I am inclined to be a little generous this morning. Mr. Sakata, please proceed with your testimony. Thank you again for being here.

STATEMENT OF MR. ROBERT SAKATA, AGRICULTURAL WATER POLICY ADVISOR, COLORADO DEPARTMENT OF AGRICULTURE, BRIGHTON, COLORADO

Mr. SAKATA. Thank you very much. Thank you, Senator and Chairman Bennet. Thank you, Ranking Member Marshall. It is a pleasure to be here, and thanks to the staff as well. As you said, my name is Robert Sakata. Our family has a farm in Brighton, Colorado, and I am privileged to serve as the ag water policy advisor for the Colorado Department of Agriculture.

First, as you did, welcome everybody to the city of Burlington. It is a pleasure to have you all here. Thanks to your wonderful staff, all the hard work that they did to organize this, and thanks to Chairwoman Stabenow for also allowing a field hearing to be here. We really appreciate all the work the committee is doing. I am very humbled, honored, and really intimidated to be here today to lead off the discussion but will do my best to start us off with a broad overview of the challenges that I see agriculture is facing in the arid West.

To highlight the scope of the problem facing us, I refer to the USDA Ag Census. The most recent one indicates that over the last—most recent 25-year reporting period, Colorado has actually lost over a million acres of irrigated lands, and that accounts for, surprisingly enough, 80 percent of the irrigated land reduction across the entire United States. There is a tipping point, and I think we are approaching it. What is causing this reduction? I will highlight four factors.

The first is our changing climate. The rising temperatures are not only increasing irrigation, municipal, and industrial needs, but is drying the soils leading to less water reaching our streams and rivers. This is also putting much more stress on our mountain watersheds, making the work on watershed protection and forest health imperative. Second is the increasing municipal and industrial demand due to increasing population growth. The Colorado Demography Officer indicates that growth is forecasted to continue to grow, and most of that growth is going to be around the current population centers.

Third are the efforts across the State to manage our groundwater resources. Prime examples are here in the Republican River and the Rio Grande Basin. You will hear from the leaders in these efforts. I have the utmost respect for their dedication to achieving the goals that they have set, especially considering how arduous a process and effort that is. In Colorado, as you know, the State owns the water. It allocates that water for beneficial use based on the seniority of water rights, a system called prior appropriations. Our State has worked very hard to do this fairly, to protect senior water rights holders, and to be in compliance with compact agreements with our neighboring States. This has been and will continue to be challenging, expensive, and painful for agriculture as farm and ranch families are battling on the front lines of this water scarcity. A personal example on our farm happened on May 8 of 2006 when the State engineer ordered over 440 alluvial groundwater wells to be shut down in the South Platte Basin because they were found to have inadequate augmentation plans. We had four of those wells on our property, and we just watched those crops wither away and die that year.

Finally, the most important factor why irrigated lands are decreasing is due to the tough financial situation most farmers and ranchers are in. The USDA Economic Research Service reports that out of each food dollar spent, only 7.9 cents makes it back to farm production. This 7.9 cents is the foundation of our food supply and is carrying the rest of society on its back. We need to make smart investments in agriculture to protect our future. In my written testimony, I provide an example on our farm where we invested in

new equipment in hopes of improving soil health, but how costly a mistake that first year was for us. We were lucky. We survived. Other farmers are not as lucky.

I have had the opportunity to travel across the State and see firsthand the variety of challenges farmers and ranchers are facing. What amazes me is their ingenuity and determination to stay in farming. What is perfectly clear to me, too, is that there is no one activity, no one action or single farm practice that is the solution. The strength of Colorado agriculture is our diversity. Whether it is the high elevation pastures where flood irrigation is providing late-season return flows to support the environment, or drip irrigated vegetables pushing the irrigation efficiency to the limit, each plays an important role in the system as a whole and should not be discounted.

The COVID–19 pandemic revealed the dangers of a limited supply chain. This highlights the need for us to build resilience in our food system. An important way to do that is to support local agriculture. In my written testimony, we will find examples of the local effective programs helping farmers and ranchers adapt to the aridification we are seeing, and you will be hearing about some of that work later today. As the ag water policy advisor, I commit to work with our tribal, Federal, State, and local governments, as well as collaborate with academic institutions, farmers and ranchers, their communities, and conservation partners, not only across our State, but across the region to find ways to maintain adaptive farm and ranch systems.

In closing, thank you for all the work that you do. Thanks in particular for your support for improving rural mental health. As stresses in our agricultural communities are greater than ever, it is important that we focus on this. Moving forward, I hope that you will commit to increasing your support of the valuable locally led initiatives like those of our conservation partners and those in the Colorado Department of Agriculture that you will hear more about from our commissioner of ag. It is this local expertise, knowledge, and dedication that provides the best opportunity for success. Thank you.

[The prepared statement of Mr. Sakata can be found on page 56 in the appendix.]

Senator BENNET. Thank you. Thank you, Robert, for that excellent start to the hearing. Mr. Goble, you are recognized for 5 minutes.

STATEMENT OF MR. PETER GOBLE, CLIMATOLOGIST, COLORADO CLIMATE CENTER, COLORADO STATE UNIVERSITY, FORT COLLINS, COLORADO

Mr. GOBLE. Thank you so much. Senator Bennet, Senator Marshall, thanks again for holding this hearing. I consider it an honor and a privilege to give my testimony to you all today.

Senator BENNET. Why don't you lean in a little bit——

Mr. GOBLE. Yes, of course. As Senator Bennet said, my name is Peter Goble, and I am a climatologist at the Colorado Climate Center at Colorado State University in Fort Collins. My professional background is in researching climate change and climate variability as well as water availability in Colorado and the Western

United States. The Colorado State Climate Office has a three-pillar mission of, one, data collection. We run an agricultural weather station network, similar to the one you will hear about in just a few minutes from Kansas. Two is climate research, and then three is education and outreach.

So I have had plenty of chances to discuss climate change and climate variability with folks all across the State, including farmers. Our office recently completed a study that was funded by the Colorado Water Conservation Board, in which we synthesized the observed and projected changes across the State in temperature, precipitation, water resources, and natural hazards. I want to thank my colleague, Dr. Becky Bolinger, for leading this effort as well as State climatologist, Russ Schumacher, and Jeff Lukas of Lukas Climate, for their enormous roles in writing this report.

You do not have to study Colorado's climate long to know that farming and ranching here is not for the faint of heart. We rely on an average of only 15 to 20 inches of precipitation here in Eastern Colorado to grow our crops. That is only about half of what falls over America's heartland in the area that Senator Marshall was talking about supporting cover crops earlier. We also know that that precipitation is highly variable from year to year. A wet year, like 2015, will bring over 25 inches of precipitation right here in Burlington, Colorado, whereas a dry year, like 2002, brings less than 9 inches and is disastrous.

A poor crop like that can really destroy a farmer's profit margins, and a poor year of forage can force ranchers to make difficult decisions about whether or not to cull their herd. Moreover, our precipitation here in Colorado does not all fall as cold soaking million-dollar rains. Sometimes it is the severe thunderstorm that are bounties run off the field before they get to soak into the soil. Sometimes it is hail that shreds the local crops, and sometimes it might be a spring blizzard that threatens livestock during calving season.

One other lesson our climate data tells us is that our climate is warming, a trend that is consistent with warming temperatures around the globe and primarily driven by anthropogenic emissions of greenhouse gases. The National Centers for Environmental Information shows us that our average temperatures here in Colorado have warmed by 2.9 Fahrenheit over the last 125 years, and that trend has accelerated since the 1980's. Precipitation has not significantly increased or decreased long term. However, it is, again, highly variable, and we have certainly had more than our fair share of drought recently. On top of that, with the warmer temperatures, we are seeing lower snowpack values in winter and spring across the Western U.S., which is a very important resource as that snow melt is irrigation water for many farmers and ranchers across the region when it melts in the spring and summer.

Furthermore, these hotter summers that we are experiencing also have an impact on our water balance. Hotter weather raises evaporation rates and transpiration rates and can lead to crops losing the soil moisture underneath them more quickly. Sometimes in the blistering heat, the crops simply shut down. Hotter summers indeed do lead to more frequent and severe droughts, which de-

crease crop yields and hurt the bottom line of our honest, hard-working farmers.

The wet years are not without challenges either. 2023 ended up setting records for severe weather reports across Colorado. We set records for the most, 1-, 2-, 3-, and 4-inch diameter hail events across the State, and I have actually brought with me a mold of our previous record hailstone from 2019, which occurred just down the road in Bethune, Colorado. Last year, we broke this record with a 5-inch hailstone near Yuma. Of course, the folks near Kansas have told me that this is not necessarily all that impressive, but it is new for us.

[Laughter.]

Mr. GOBLE. This all sounds a little bit grim, but I do want to leave with a message of hope here. The impacts of climate change can be combated through both mitigation and adaptation. From a mitigation standpoint, renewable energy resources have become much more cost competitive over the last 10 years. Here in America, we are emitting carbon at rates below what we emitted 20 years ago, and around the globe we are emitting carbon at rates below what climate scientists put into their climate models as the business-as-usual scenario 15 years ago. We have come a long way, but we still have lots of work to do. Humans are also highly adaptable creatures. By continuing to study, update, and adhere to the best crop and land management practices, we can continue to thrive in the face of intensifying natural hazards.

Finally, as a scientist, I have to use this opportunity to advocate the importance of long-term data collection. Long-term consistent climate observations are the backbone of our understanding of climate globally and right here at home. It is vital that we continue to invest in networks like the National Weather Service's Cooperative Observer Network, State mesonets like the one we run and the one you will hear more about from Kansas, and even community science efforts, such as the Community Collaborative Rain, Hail, and Snow Network, that allow folks from all walks of life to contribute to our understanding of weather and climate.

Together we can learn to adapt and ensure that our food system is resilient to an ever-changing environment. Thank you so much.

[The prepared statement of Mr. Goble can be found on page 65 in the appendix.]

Senator BENNET. Thank you, Mr. Goble, and, Ms. Owen, you are now recognized for 5 minutes.

STATEMENT OF MS. CONSTANCE C. OWEN, DIRECTOR, KANSAS WATER OFFICE, TOPEKA, KANSAS

Ms. OWEN. Thank you, Chairman Bennet. Good morning. My name is Connie Owen, and I am the director of the Kansas Water Office, and I would like to thank you, Chairman Bennet and Ranking Member Marshall, and your staffs, and both States for the partnerships that we have in many levels and for the ability to appear before you today.

The Kansas Water Office is located in Topeka, Kansas. Our office is the State policy planning and coordination agency for all water issues in Kansas. A flagship responsibility of our office is the development of the Kansas Water Plan. One of the five guiding prin-

ciples of the Kansas Water Plan is reducing our vulnerability to extreme events, which include drought, flood, and climate change.

In recent years, the increasing severity of drought in Kansas magnifies the urgency of the need to address this threat. The Kansas Water Office is responsible for monitoring drought and assembling the State Drought Response Team to recommend to the Governor to issue a new drought declaration, which makes counties eligible for assistance depending on the level of drought intensity. The latest drought declaration was issued just June 10, 2024. Although this declaration is not nearly as dire as in some recent years, the forecast for the coming summer is for warmer and drier conditions.

In Kansas, the economic driver for most of the State is agriculture. In a drought, the lost income stream can be felt down the supply chain, affecting entire communities. The impact can lead to higher food prices and food scarcity. Ultimately, national security interests are at risk. Just 2 years ago, Kansas suffered one of the driest periods on record since 1895. Many areas in Kansas saw records broken for the least amount of rainfall since recordkeeping began. That year, extreme heat and wind contributed to agricultural devastation in Kansas. The summer of 2022, the intense heat and lack of precipitation, for example, was responsible for the deaths of thousands of cattle in several Kansas counties. Kansas suffered another extreme drought, which peaked in 2012, the warmest and one of the driest years on record. The Kansas Department of Agriculture estimated the 2012 drought caused more than $3 billion in drought-related crop losses in Kansas. More than $1.3 billion in crop insurance, indemnity payments for failed commodities were paid to Kansans in 2012.

Temperature increases in the State are also projected to increase the frequency and severity of wildfires. In December 2021, the warmest December to date in Kansas, devastating wildfires burned over 165,000 acres of land in Central Kansas. The increased need for water also worsens the severe depletion of the Ogallala Aquifer. According to the National Drought Mitigation Center, droughts also result in negative environmental and social impacts. Coping with drought also presents a challenge for public water suppliers. The Kansas Water Office is responsible for the management of State-controlled conservation storage in 15 Federal reservoirs. That supply serves two-thirds of the State's population.

Two hundred and forty water systems or cities in Kansas rely at least in part on the Federal reservoirs in Kansas. Within this group, the largest population centers include Johnson County, Wichita, Topeka, Manhattan, and Salina. Many of these communities survive drought only because of support from Federal reservoir releases. Reservoirs filling with silt makes it harder to help with drought, however. The increase in sediment shrinks the storage capacity for water. Drought also affects communities who rely on other sources of water. The small town of Caney, population less than 2,000, relies primarily on the flow of the Little Caney River, which virtually ran dry in 2023. The town employed dramatic major restrictions. The situation improved, but the city is facing expensive infrastructure improvements to solve the problem.

In summary, droughts in Kansas have been increasing in frequency and intensity. Every sector, including agriculture, municipalities, industry, recreation, and the environment, is experiencing and will continue to experience negative impacts of drought. The fact that the State's water supplies are shrinking from depletion of the Ogallala Aquifer to sedimentation of Federal reservoirs only accelerates this crisis. Adaptation and planning for resilience will be critical. Thank you very much for this opportunity to testify today.

[The prepared statement of Ms. Owen can be found on page 67 in the appendix.]

Senator BENNET. Thank you, Ms. Owen. Mr. Redmond, please go ahead.

STATEMENT OF MR. CHRISTOPHER A. REDMOND, ASSISTANT METEOROLOGIST, KANSAS MESONET MANAGER, AGRONOMY, KANSAS STATE UNIVERSITY, MANHATTAN, KANSAS

Mr. REDMOND. Good morning, and thank you Chairman Bennet and Ranking Member Marshall, for this opportunity to speak in front of you all this morning. My name is Chip Redmond. I am a meteorologist at Kansas State University, and I run the Kansas Mesonet Manager. Thanks again for this opportunity, and I am going to speak today a little bit about the drought in the High Plains and talk a little bit on, on the Mesonet itself.

You know, the High Plains, as already mentioned, can be an area of extreme vulnerability of both extreme wet and extreme dry. When we look at climate over time, we are talking about averaging over a 30-year period. Typically, over these extremes, though, drought tends to be the most impactful. Last year did bring drought relief to a lot of the High Plains in 2023. Unfortunately, this also shifted the drought further east into Central Kansas. Like Connie mentioned, places like Caney had significant issues last year.

Drought never completely goes away. It is a part of our climate, and it tends to shift and move as you go through time, and does not typically stick to one location for usually more than several years. As we moved through 2023, that relief was brought by the change in the Eastern Pacific equatorial water temperatures. That is what we call the ENSO region, or El Nino Southern Oscillation. We transitioned from what was a 3-year period of La Nina that brought a lot of that drought into El Nino that, thankfully, brought much-needed moisture for this region. That happened in the spring of last year, so a little bit over a year ago. Unfortunately, that surplus of moisture was short-lived. As of early this June, we saw that El Nino condition in the East Pacific already decrease in warmer-than-normal temperatures back to neutral conditions, with projections of potentially La Nina redeveloping by the fall of 2024.

An additional oscillation that we look at typically is called the Pacific Decadal Oscillation. It is a 10-year decadal transition, so it usually is very persistent. It can also have a significant impact on the North American climate. The Pacific Decadal Oscillation has been very negative, basically cooler waters along the Northern Pacific coast of Canada and America, and warmer water out in the middle. That negative Pacific Decadal Oscillation tends to strengthen or enhance the La Nina conditions. Unfortunately, that means

continued drought concerns, and when we look at La Nina union potentially redeveloping, it appears this period of increased moisture has been short-lived, and drought emergence seems very likely as we move further into the summer of 2024. As a result, we need to consider some of the longer-term trends of drought as well.

For example, periods between rainfall events are increasing in length. We typically consider a 10th of an inch, or 0.1 inches, a wetting rain that has impact on the soils and crops in a positive way. Just looking at Tribune—they have a National Weather Service cooperative observer site there—those durations and lengths of periods without rainfall have increased by over 25 percent since the 1890's. Unfortunately, the rainfall that we have seen with that has also increased, so while we are having longer periods of no precipitation, we are seeing periods of heavier rain when we do get moisture. Just with one-inch heavier rain events, we have seen a 20-percent increase at Tribune, at that very important National Weather Service cooperative site. Again, heavier rainfall, but longer periods of dry between them. This makes agriculture very challenging because when we get that heavier rain, it tends to run off and not infiltrate into the soil, and then we have drought right after that that makes higher demands on natural resources like the Ogallala Aquifer.

The need for more efficient water uses increase the demands for accurate weather and climate data, especially considering places like Tribune's NWS COOP that we rely heavily on for these climate records. Unfortunately, since 2000, Kansas has lost about 36 percent of their long-term cooperative observers in the State. This makes networks like the Kansas Mesonet or the Colorado Agricultural Meteorological Network (CoAgMET), extremely important because they are filling the role that these COOP observers cannot as we move forward. Not only do they measure critical things like temperature and precipitation, but they also measure other variables that are extremely important to agriculture, like solar radiation, wind, and soil moisture.

Another is, as Connie mentioned, there have been ag issues with livestock. Back in 2019 alone, the Kansas Mesonet data supported 1,600 ag livestock—USDA Livestock Indemnity Program claims that resulted in $7.6 million back into producers' hands that year alone. There are a lot of other programs that rely heavily on weather data, of which I will not digress here, but I will say that the National Mesonet Program is an oversight program that aggregates all the Kansas Mesonet, CoAgMET, and other networks in the Nation together. This is pivotal in keeping continued good, long-term climate and weather data records continuing and sustain them long term. This makes things like the National Weather Service Reauthorization Act and National Mesonet Authorization Act critical in sustaining these networks.

Thank you for this opportunity to speak today on behalf of the Kansas Mesonet and the Kansas Climate Office.

[The prepared statement of Mr. Redmond can be found on page 79 in the appendix.]

Senator BENNET. Thank you, Mr. Redmond, for making the trip. Mr. Funk.

STATEMENT OF MR. ALEXANDER FUNK, DIRECTOR OF WATER RESOURCES AND SENIOR COUNSEL, THEODORE ROOSEVELT CONSERVATION PARTNERSHIP, DENVER, COLORADO

Mr. FUNK. All right. Chairman Bennet, Ranking Member Marshall, thank you for the opportunity to speak with you today. My name is Alexander Funk. I am the director of Water Resources and senior counsel with the Theodore Roosevelt Conservation Partnership, or TRCP. Established in 2002, the TRCP's mission is to guarantee all Americans a quality place to hunt and fish. The TRCP is a coalition-building organization that unites and amplifies the voices of hunters and anglers around issues that affect fish and wildlife conservation, habitat, and access.

TRCP encourages Congress to move quickly to pass a bipartisan farm bill to ensure funding and technical assistance are available to increase the pace and scale of innovative drought adaptation and mitigation efforts benefiting agriculture, fish, and wildlife. Failure to pass a farm bill in this Congress could jeopardize the availability of certain USDA conservation programs, which would be a significant blow to addressing ongoing drought conditions in Colorado, Kansas, and other Western States. These programs were voluntary, incentive-based, effective, and, if available, can go a long way toward addressing water supply challenges affecting both agriculture and fish and wildlife.

Hunting and fishing play an important economic role nationally and here in Colorado and in Kansas. Drought and climate change threaten availability of hunting and fishing and, as such, our economy many ways. These drought-related impacts are not just limited to fish. Droughts are known to reduce waterfowl and upland game bird habitats due to declines in suitable habitat and food, drought and other extreme weather conditions, disease. Human impacts, such as roads and fences, are also known to contribute to declines in big game populations, such as mule deer.

The farm bill can play a vital role in addressing these impacts and broader water supply challenges affecting Western States, and can do so through a multi-tidal approach, meaning that beyond the conservation title, there are ample opportunities within the forestry, research, rural development, and other titles to address water-related challenges. For example, most Westerners receive their water from forests. Forests are home to our natural water infrastructure that source watershed streams, wetlands, and meadows that sustain drinking and irrigation water across the West. The farm bill presents an opportunity to enhance the conservation and restoration of these headwater forests through programs such as the Strengthening the Water Source Protection Program, which allows the Forest Service to enter into agreements with water users to develop and implement source water plans and actions from fuels management to riparian restoration efforts, both of which can help enhance water availability.

That said, the conservation title can play a great role in addressing drought conditions, and there are several opportunities to help Western farmers and ranchers. The Conservation Reserve Program, for example, can help address drought in multiple ways by encouraging the restoration of perennial cover on environmentally

sensitive agricultural lands, which, in turn, reduces water loss to evaporation and increases water infiltration rates. The same cover provides essential wildlife habitat and improves water quality. However, many aspects of this program have not been updated since the 80's when it was first established, including the ability to update rental rates to reflect the program's ecological value and encourage greater program enrollment. Other challenges include a lack of cost share for managing CRP grazing lands.

The 2018 farm bill also, for the first time, authorized NRCS to enter into EQIP contracts with water management entities, such as groundwater management districts and ditch companies, to implement watershed-scale conservation and efficiency measures. TRCP supported this provision given the potential for these watershed-scale efforts to benefit Fish and wildlife. Despite the promise of this change, there have been significant challenges with implementation of this provision, ranging from adjusted gross income restrictions, to complicated contracting and eligibility requirements, to lack of NRCS staff capacity and training to implement the program, as well as a lack of dedicated funding to support these investments.

In early 2023, USDA released a Western Water and Working Lands Framework outlining challenges and conservation approaches to support Western farmers and ranchers, including the modernization of irrigation infrastructure, improving water supply forecast frameworks, and restoring streams and wetlands. Still, unlike other targeted USDA frameworks, this Western framework lacks dedicated resources to support implementation. We encourage Congress and USDA to continue working collaboratively to ensure these adequate resources and capacity are available to implement these existing measures.

So in closing, thank you again, Senator Bennet, Senator Marshall, other members of the Subcommittee, for the opportunity today to speak to you about the drought and climate change impacts facing Western agriculture and our Western watersheds. The TRCP and our hunting and fishing community partners are ready to work with you to craft a farm bill for agriculture, fish, and wildlife, and I look forward to any questions you may have.

[The prepared statement of Mr. Funk can be found on page 86 in the appendix.]

Senator BENNET. Thank you. Thank you all for your excellent testimony. Appreciate your being here. I am going to start with a few questions. I am going to try to keep it to 5 minutes, and then I will turn it over to Senator Marshall, and we will see if we need to sweep up at the end, but thank you. That was extremely helpful.

Robert, you are both—as every Colorado farmer is, you are both a farmer and a water expert, and I think if you could boil it all down, when you think about the future of Colorado, the next quarter century, or however you want to think about it, what is it that you are most worried about with respect to drought, and how should we be thinking about that?

Mr. SAKATA. Well, thank you Chairman Bennet. I guess, first, I would like to preface that, you know, I have siphoned many siphon tubes and shoveled many furrows and changed a few gear boxes on the center pivots, but I would call myself more a water groupie

than a water expert, just so you know. Like you said, I think I am in a great position where I have been on the farming side and now on the policy side, so I really appreciate being able to think about this in the broad range.

I am really optimistic, you know. As you know as you travel across the country, we see how dedicated farmers and ranchers are, how hard working they are, but I think just like on our farm, and it may sound kind of counterintuitive, I think we need to be willing to support experiments that are going to fail. It does not make sense, right? You are going to support something that does not work, but really that is what is happening with farmers and ranchers, that we do not have that financial buffer anymore. We cannot take risks, and change is hard, so if you are going to ask us to change and try something new, we will need assistance to mitigate those risks. On our farm, you know, like I said, we have invested in some no-till equipment, and the first year was a—we made mistakes, and it was a financial nightmare, but luckily we were able to sell some of our vegetable equipment and make it up. Again, it does not make sense, but I think we need to be able to fund experiments that may fail.

Senator BENNET. That makes sense to me. Speaking of incentives, and, Mr. Funk, you mentioned some of the difficulties we have been having with the RCPP, which has been a concern of mine. I think that program has got a lot of potential. Within the Conservation Reserve Program, CRP, which you also mentioned, rental payments are based on the ground value of the land, as you know, so we are paying higher rates for more productive land, not necessarily the most environmentally sensitive ground. Could you describe how the CRP payment structure could better drive key wildlife climate or soil health outcomes, like keeping the topsoil in place here in Eastern Colorado or Western Kansas?

Mr. FUNK. Thank you for the question, Senator Bennet. We can actually absolutely do a better job of incentivizing positive outcomes through the Conservation Reserve Program. I would highlight two large issues, one being that the annual payment limit for the program has not been updated since 1985. Especially when you are facing regions with high farmland values and adjustments for inflation, it really cramps down on enrollment opportunities, especially for higher-paying practices, like the State Acres for Wildlife Enhancement Program, which does help support riparian buffers and wetland restoration that helps support drought resilience.

Also, as you just said, you know, rental rates are based on acreage, dryland rental rates, and soil productivity, and, therefore, with regions that have lower soil productivity, like Eastern Colorado, the implication there is that farmers and producers that would like to potentially participate in CRP potentially are faced with those lower rental rates compared to other regions, and that really does affect enrollment rates on a whole. When you combine that with drought and extreme weather, that puts soils in this region at significant risk of either further degradation, which, again, creates a positive feedback loop of that soil's ability to maintain moisture, and to help farmers adapt to less water supply generally.

So to address these challenges, you know, we would consider, you know, reforms that potentially make CRP work from Colorado to

Iowa. We need a program that works for all producers across the country, not just targeted regions, and certainly not disadvantage enrollment of highly erodible lands. I know there are several proposals actively discussing that, and we would be happy to talk to your office more about some of those options.

Senator BENNET. Thank you. Well, we look forward to that continuing conversation. I hear about it all the time when I am in—out here on the Eastern Plains. Mr. Goble, I am going to ask you one more—one question, then I will turn it over to my colleague here. We talked—we heard a little bit of testimony at the outset here about what the effect on our economy might be as a result of everything that we are facing. I wonder how Colorado Climate Office is seeing extreme drought or severe weather events affect agricultural production in this State and regionally. Could you tell us what those trends look like?

Mr. GOBLE. Yes, absolutely. Thank you so much for the question, Senator Bennet. When it comes to agricultural production, thankfully, for the most part, advances in crop genetics to this point have outpaced the degradations that we would expect in yields from increasing drought, but we do absolutely see that in drier years, like 2020 or 2022 recently, that the drought has an adverse impact on yields. That is something that we are very much concerned about, especially as these hotter than the historically normal summers become more consistent. I would also add that we are very concerned with the way that a warming climate changes our hydrologic cycle where even if we do get as much precipitation as we have historically, more of it evaporates or does not make it into the soils and end up actually being effective precipitation. That is definitely something we are concerned with.

Senator BENNET. Thank you. Senator Marshall.

Senator MARSHALL. Thank you. My first question is for Ms. Owen. Ms. Owen, as you know, Kansas has seen an invasion of invasive species, salt cedars, different species lining our river, sucking and removing water. We have done several pilot programs where we have removed cedars and salt cedars from those rivers and return flow to creek basins that we have not seen water flow for decades. My farmers and ranchers complain that they, due the lack of flexibility in some of the EQIP programs, if you do not take on all the rules, you cannot do that particular practice. Can you just speak to what practices could be supported by the Federal Government in mitigating the reduction of surface water flow?

Ms. OWEN. Thank you for the question, Senator Marshall, and as you know, there is an interrelationship between surface water and groundwater. When groundwater is being used excessively, it pulls from the stream and vice versa when there is an alluvial connection. In effect, helping to restore surface flow is often a factor—is often impacted by the use of groundwater. One of the best things we can do to return surface flow is to strengthen groundwater aquifers and reduce the draw from the aquifer. The Federal Government does have roles to play in helping to reduce aquifer use, and one way is to help with water right buyouts for those who are willing to sell so that we can reduce the demand on the aquifer. There are mechanisms for supporting fallowing techniques.

One very important aspect that the Federal Government is currently involved with—we have some cost share programs in Kansas—is supporting the use of new technologies for producers to use, for example, soil moisture probes that can tell the producers when they need to irrigate and when they do not. That allows for more precision management and saves an awful lot of water and reduces the demand on the aquifer. Another thing that we hear a lot from producers, and I cannot speak to this personally, but what I am hearing is that the crop insurance programs at times encourage the use of water when it is not needed. For example, if early in the season they know their crop will fail for some reason, whether it is waiting for an adjuster or an agent, they are required to continue to water a crop they know will not survive.

Senator MARSHALL. Thanks.

Ms. OWEN. Some of those tweaks could be made to the Crop Insurance Program. Those are—those are a few mechanisms the Federal Government can make.

Senator MARSHALL. Thanks, Ms. Owen. The other—I am on this kick on this invasive species. Something I learned, thanks to my friends at KLA and others, is that by removing these invasive species, it actually improves the carbon sink——

Ms. OWEN. Mm-hmm.

Senator MARSHALL [continuing]. of the soil as well, so that is great to know. We will turn to Mr. Funk for a question for you. Continuing on this theme of needing some looser guardrails, one of the concerns from the IRA farm bill—the IRA and the farm bill are some of the climate sideboards, that they are a little bit too tight for us to utilize. In your testimony, you mentioned irrigation lining and piping as two conservation practices that help produce unnecessary pumping and irrigation systems. Do you have any good, I guess, environmental reason why irrigation piping is an approved practice under the IRA while irrigation lining is not when they both could help reduce fuel from reducing pumping?

Mr. FUNK. Thanks for the question, Senator Marshall. My understanding of sort of why certain practices have been added to the NRCS eligibility list, the IRA funds, largely stem from basically whether or not NRCS had an existing methodology to account for those carbon sequestration benefits associated with the practice. When the initial list was released in Fiscal Year 2023, they lacked that data for a lot of irrigation modernization improvements. That said, they have offered two public comment processes since then, and several partners, including us, submitted, you know, data showing that some of those on-farm efficiency practices do have carbon benefits, and they were added. That said, a lot of that—it seems like there is still a burden of proof on sort of the entities sort of saying like, hey, there is adequate data for this, and then it is up to NRCS to kind of weigh that data, but I cannot speak to how much, like, they put toward, like, any one practice or the other, yes.

Senator MARSHALL. Thanks. I will finish up with a question for Mr. Redmond. Mr. Redmond, growing up, our lives stopped over the noon lunch hour and the weather report at 10:15, 10:30, but now we have 24/7 access to the weather. What would be most helpful to my producers is long-term weather reports, and not just how

much, but when the rain is going to fall. It would impact should I be planting soybeans or corn this year? Maybe I should go to milo, which uses even less water—I am not sure if you all call it sorghum or milo here, but we still call it milo in Kansas—as well. What is the opportunities and the improvements in long-term forecast look like as a meteorologist?

Mr. REDMOND. Yes, thanks for that that question, Senator Bennet—or Senator Marshall. There is a couple things to consider. Our technology and computers has gone much, much further, whether from the local modeling component at the State level to large-scale global modeling, has greatly improved our forecasting for—you know, we can—we used to only be able to predict the weather for several days out, and now we are 14, 30 days out pretty consistently. That, combined with surface observations, things like the Kansas Mesonet or the National Weather Service Cooperative Network, they measure more data than we have ever measured before. We even have airplanes that are measuring.

Senator MARSHALL. Well, what is keeping us from—30 days is not enough, okay? I need 90 days or 6 months.

Mr. REDMOND. Our—the knowledge gained from those observations has helped us gain understanding in climate oscillations, such as ENSO or the Pacific Takeda Oscillation, that help us really get good forecasts out months in advance. When we look at this summer, for instance, we are already projecting out that drought is going to develop across the High Plains this summer, and we expect below normal precipitation as a result to help people make better decisions like that. I think that we have really come a long ways in that to the point where, from the State climate perspective, we are yielding those questions to producers and we are providing on-the-ground support.

Senator MARSHALL. Thank you. Thank you.

Senator BENNET. You have anything else?

Senator MARSHALL. I am good.

Senator BENNET. Thank you very much to the panel for your excellent testimony, and we are going to transition now to the next group of witnesses, please, and I would say thank you, the audience's patience as well. Thanks.

[Applause.]

[Pause.]

Senator BENNET. If people could grab their seats, we will—we will start—we will start the next panel. Thank you very much for—all for being here.

Commissioner Kate Greenberg is our first witness. She is the Commissioner of Agriculture for the Colorado Department of Agriculture. She is the first woman to serve in this role. Commissioner Greenberg has worked in agriculture for more than 15 years. Her department serves producers that are operating over 36,000 farms and ranches in Colorado. She is a member of numerous State boards and commissions, past president of the Western U.S. Agricultural Trade Association, and former chair of the Western Association of State Departments of Agriculture. She is also the recipient of the Emerging Conservation Leader Award from Western Resource Advocates. Thank you for being here today, Kate. It is great to have you, and I look forward to your testimony.

Another commissioner, Mr. Don Brown, serves as director of the Republican River Water Conservation District and is a third-generation farmer in Yuma County, Colorado. There, he has run several successful businesses while spending most of his career managing and growing his family's farming operations of irrigated crops, dryland crops, and cattle. Don preceded Kate as Colorado's Commissioner of Agriculture under then Governor John Hickenlooper. He is active in numerous agricultural organizations and currently serves as a member of the Farm, Ranch, and Rural Communities Federal Advisory Committee to the EPA administrator. I am grateful for him to be with us at the hearing today, and I look forward to your testimony, Don.

Senator Cleave Simpson. Mr. Simpson is the general manager of the Rio Grande Water Conservation District. He also serves as Colorado State senator, representing 14 counties in Southern and Southwest Colorado. I know a little bit about traveling this beautiful State of ours from every corner to the other corner, and I can tell you that Cleave Simpson seems to know the same—the same routine. I know he is leaving today to go to Montrose, so this is a busy day for him. I am grateful that he was able to fit us in.

Senator was born and raised in Alamosa, Colorado. He is the fourth generation of his family to farm and ranch in Colorado's San Luis Valley. As general manager of the district, he works across the San Luis Valley to address the water security issues in the Rio Grande Basin. He has served as representative to the Rio Grande Basin Roundtable and the statewide Interbasin and Compact Committee. Thank you again for being here today, Cleave. I look forward to your testimony. Then, Senator Marshall, please introduce your witnesses, and then we will get started.

Senator MARSHALL. Well, I am honored—I am honored to introduce two Kansans to this panel. First is Mr. Earl Lewis. Mr. Lewis is the chief engineer and director of the Kansas Department of Agriculture's Division of Water Resources, which administers some 30 laws and responsibilities, including the Kansas Water Appropriation Act, which governs how water is allocated and used. The chief engineer oversees policies related to these laws, including water structures, stream obstruction, and represents Kansas in interstate water matters. Mr. Lewis graduated from the University of Kansas with a bachelor's degree in mechanical engineering. He is a licensed professional engineer in the State of Kansas. He and his wife, Sherry, live in Topeka and have two sons.

Then next, I am honored to introduce Mr. Pat Janssen, who resides on a farm that he operates with his family some 45 miles east of Dodge in South Central Kansas. A majority of their operation consists of irrigated crop-producing corn, soybeans, wheat, milo, and grass hay. The farm also has a cow-calf stocker cattle unit, as well as providing custom farming and custom irrigation services. Mr. Janssen has been extensively involved in irrigation and efficiency work for the last 15 years on his operation and through his association with Water PACK. We look forward to both of your testimoneys. Thank you.

Senator BENNET. Thank you. Commissioner Greenberg, please get us started.

STATEMENT OF MS. KATE GREENBERG, COMMISSIONER OF AGRICULTURE, COLORADO DEPARTMENT OF AGRICULTURE, BROOMFIELD, COLORADO

Ms. GREENBERG. Thank you. Thank you, Chairman Bennet and Ranking Member Marshall, for the opportunity to speak with you here in Burlington, Colorado. My name is Kate Greenberg, and I serve as Colorado's commissioner of Agriculture at the Colorado Department of Agriculture under Governor Jared Polis.

CDA serves as a partner with our agricultural communities in meeting current and future challenges. These challenges include everything from drought and climate change, water and soil health, to labor market access, foreign animal disease response, and training the next generation of farmers and ranchers. Our focus in tackling these challenges has been on building producer-led, voluntary, and incentive-based solutions. Over the past 5 years, we have worked with farmers and ranchers to create the Colorado Soil Health Program to advance stewardship, the resilience of the soil to extreme weather events, and enhance farm profitability.

CDA received a $25 million a USDA Partnerships for Climate Smart Commodities grant for soil health, which helped us enroll over 500 producers in the program and advance new soil health practices on over 65,000 acres. We created the Agricultural Drought and Climate Resilience Office to mitigate the impacts of a warming climate. We have expanded our renewable energy program to include agrivoltaic research, such as integrating crop and livestock production into existing solar farms and using bifacial solar panels as fence rows and windbreaks. We are providing technical assistance for USDA's Rural Energy for America Program (REAP). Beyond conservation, we have been expanding market access for producers, both at home and abroad, with a keen interest in markets that reward climate smart practices. We have doubled our support for paid internships, created an ag worker outreach program, and issued over $17 million in innovative financing for beginning farmers. We have to do more to set young people up for success in a rapidly changing world.

Farmers, ranchers, and agricultural workers are on the front lines of drought and climate change. They feel firsthand the impacts of hotter weather, tougher droughts, more frequent pest cycles, and back-to-back hailstorms, all of which we have seen in just the past few weeks here on the Eastern Plains. We live with drought in the West. What we face now is aridification due to climate change. Conservation, drought, and disaster relief programs must reflect this reality.

Federal programs need to be flexible to allow for innovation at the State, local, and producer levels. One way of doing this is by continuing to partner with States to support the programs that we are already implementing, such as we have seen with our soil health and renewable energy programs. Federal programs also need to be tailored to meet regional needs, in our case, the needs of the West. For example, Colorado has been a leader in utilizing voluntary conservation easements to protect agricultural lands. Increasing funding for the agricultural Conservation Easement Program and allowing the program to cover project costs for landowners would allow for greater use of this tool for land and water

conservation. The Environmental Quality Incentives Program is a vital partner in our renewable energy efforts. Additional funding as well as increasing the program's Federal matching contribution percentage would help drive more innovation in rural energy production.

We need to ensure that we have a robust technical assistance network delivered by both USDA as well as partners on the ground. The Regional Conservation Partnership Program, or RCPP, is at a point now where we need changes to ensure its continued success. It requires extensive administrative oversight and lacks the administrative support for the program included in the cost, and that can be a big hurdle for applicants. The structure of the Climate Smart Commodities grant, on the other hand, offers an example of how to improve RCPP, such as including the allowance of administrative funding and technical assistance in the program. Another example of where we have seen flexibility is in CREP. The 2018 Farm Bill provided that dryland agricultural uses may be permitted under the Conservation Reserve Enhancement Program with the adoption of best management practices. While there have been challenges implementing this, this is an important tool for Colorado to enroll the necessary acres in CREP to meet our interstate compact requirements.

Disaster relief programs need to be fully funded to address the losses that producers face due to the increasing frequency and severity of natural disasters, including drought. In order to both encourage building drought and climate resilience and maintain the long-term financial stability of disaster relief programs, we need to focus on incentivizing practices that will be resilient in the future and do so with farmers and ranchers at the table. Finally, we need to continue to make investments in research, incentive programs, and technical assistance that help more farmers and ranchers reduce greenhouse gas emissions, increase carbon sequestration and water conservation, and adapt to a changing climate. This is an investment that must be made at the Federal level to ensure continued food and economic security for the country.

Our partners at USDA regularly exhibit the kind of partnership and flexibility that make these programs successful. We need to continue to build on these relationships as we adapt Federal programs. I appreciate the opportunity to discuss this work with you today and look forward to any questions you have. Thank you.

[The prepared statement of Ms. Greenberg can be found on page 98 in the appendix.]

Senator BENNET. Thank you, Commissioner. Thank you so much for being here today. We really appreciate it, somebody who knows something about dryland crop. Mr. Brown, would you like to go next?

STATEMENT OF MR. DON BROWN, DIRECTOR, REPUBLICAN RIVER WATER CONSERVATION DISTRICT, YUMA, COLORADO

Mr. BROWN. Thank you. Well, thank you, Chairman, and please bear with me today. This summer cold has arrived, and so I will have to—it is okay.

Chairman Bennet and Ranking Member Marshall—it is milo. You are correct. I am with you there.

[Laughter.]

Senator BENNET. Glad we got that squared away at the outset.

Mr. BROWN. Yes, we got that squared away. I would like to share a bit of my background, and where the milo comment comes from is my great-grandfather, Andrew Brown, homesteaded near Hayes, Kansas in 1874, 150 fifty years ago. My grandfather, Albert Brown, homesteaded in Yuma, Colorado in 1911. My family has been a part of this High Plains for a couple hundred years. I am a third-generation Yuma County farmer and rancher, fourth generation working with us. We grow irrigated crops as well as dryland crops, and some have raised several thousand head of yearlings, all which relies on rainfall.

I think a little bit of history is important as well. As this arid High Plains was settled in the late 1800's and early 1900's, the push westward into Colorado from Kansas was forged by surges forward and rapid retreats. This very county we sit in today lost 36 percent of its population between 1890 and 1900, and was not due to disease. It was due to lack of rainfall. There are two fundamental and undeniable facts that still apply today: dryland farming is completely dependent on rainfall, and those farmers and communities who have some form of irrigation fare much better in times of drought.

I would like to take a moment as director of the Republican River Water Conservation District here in Colorado to talk a moment about the basin itself and the aquifer, which Senator Marshall so eloquently defined how large it is. The residents of the Republican River Basin in Colorado, Kansas, and Nebraska suffered from a devastating flood in 1935, and in order to acquire Federal funds to build dams, the States agreed on the amount of water each State had to provide down river. Dramatic expansion of irrigated acreage in the 60's altered flows, and Kansas felt as though they had no choice but to pursue legal action in courts. This led to a final settlement stipulation, and the States agreed each State would be required, per a complex groundwater model, to provide a minimum number of acre feet of water each year.

In 2004, Colorado created the Republican River Water Conservation District, the RRWCD/District, in the State's efforts to comply. We as basin users here in Northeastern Colorado have provided almost $120 million of our own money in fees for this effort. In 2016, the three States agreed that since Colorado was struggling to meet the South Fork requirements, that Kansas in lieu of water would accept Colorado removing 25,000 acres from irrigation in the South Fork by December 2029. The Colorado State engineer has made it very clear action is required, that deadlines are real, they are not optional, and that the worst-case scenario would force him to shut down all high-capacity wells here in our portion of the basin in Colorado.

The surest method to compliance is retiring irrigated acres in Colorado, and typically those retirement programs require a mix of district and USDA funds. The District is using the CREP Program, and EQIP is also beneficial but has been unreliable due to lack of funding. In 2018, as we get to the dryland farmable CREP, Kansas Secretary of Agriculture and I drafted language for the farm bill for that year, which allowed the Secretary to re permit dryland farm-

ing on qualified acres. Secretary Vilsack authorized FSA to create CCP 100, and it allows farmers to continue to farm after they give up their irrigation well. In May 2023, the USDA announced the producers could enroll irrigated land in CP 100, and you were there at the signing at the Colorado Capital, Senator Bennet.

During negotiations with FSA, we had pointed out that the requirements are too rigorous, and as of today, 1 year later, FSA offices have zero applications. Thanks to your bipartisan and bicameral support of the CREP Improvement Act, hopefully the compensation hurdle will be remedied. No question, we need this program. Also updating, as it has been pointed out earlier, that decades-old CRP payment limitation is a real barrier in helping us retire these and meet these agreements that we have made with Kansas and Nebraska.

A couple other things I would like to comment about that need to be or would like to see remedied is, as I pointed out earlier, currently, CRP rental rates reward the highly productive land, and for those who have poor lower yielding soils to enroll, they do not economically work. One of my deepest concerns as a producer is the 1985 version of CRP has morphed into a wildlife program. Prior-approved grass stands are often required to be destroyed and replaced, and in a time of climate change, tenuous reestablishment of grasses is extremely difficult. Prior-approved grass stands from decades ago should be allowed to remain. I would really like to see, as a producer, the Subcommittee continue to focus on drought-related research as it relates to developing increased drought tolerance in existing and new crops.

I think it is paramount that innovation be included in all this, but programs which are tried and true should not be abandoned or edited in such a fashion that they become unrecognizable over the years. One should not discard the original purpose of the CRP, forget that providing adequate water to livestock through pipelines and watering facilities is essential, or fail to recognize the need for supporting wise use of the Ogallala Aquifer.

On behalf of the RRWCD, I would like to thank you for having us here today. I would like to point out that we must not forget the High Plains region is of value to the Nation and its food supply. Rural communities are important part of this Nation's fabric, and most importantly of all, acknowledging that our—if our region is going to survive, our youth must have a reason to stay here. Thank you.

[The prepared statement of Mr. Brown can be found on page 103 in the appendix.]

Senator BENNET. Thank you, Mr. Brown. Thank you. Mr. Lewis?

STATEMENT OF MR. EARL D. LEWIS, JR., CHIEF ENGINEER AND DIRECTOR OF WATER RESOURCES, DIVISION OF WATER RESOURCES, KANSAS DEPARTMENT OF AGRICULTURE, MANHATTAN, KANSAS

Mr. LEWIS. Thank you, Chairman Bennet, Ranking Member Marshall. I appreciate the opportunity to appear before you today on this panel. My name is Earl Lewis, and I am the chief engineer and director of the Kansas Department of Agriculture's Division of Water Resources. In that role, I and my staff deal with water

issues across the State as well as with our neighbors. Just for the record, I would like to point out that, that we are no longer in any lawsuits with Colorado——

Senator BENNET. No, we are not.

[Laughter.]

Mr. LEWIS [continuing]. and worked very diligently with my co-panelist, Mr. Brown here, to resolve that back in 2016——

Mr. BROWN. We did.

Mr. LEWIS [continuing]. and Commissioner Greenberg as, as she came on board as well.

I will go off script for just a minute because I want to echo and, and reinforce some of Mr. Brown's comments here, especially as it relates to dryland CREP. We see that as a very valuable option, not only for Colorado to comply with the compact obligations they have, but for us to solve a number of our problems within Kansas as well. Don has obviously highlighted some of the issues that they are facing. We currently have a dryland CREP proposal sitting in DC at the national office that needs some help to try and get it across the line. We have got producers that are ready to sign up to help us solve some our water issues, but because of some of the issues have been highlighted here, it is being held up, and we probably need a little help to try and get that, again, over the line.

Again, our primary responsibility is the allocation, management, and regulation of the waters within Kansas, which becomes even more important in times of drought. The Federal Government plays a vital role in addressing drought across the High Plains, particularly the U.S. Department of Agriculture. Those roles range from data collection to drought response, and I would like to highlight a couple of things that I think that are working well but also could be improved.

First, the Federal Government's role in monitoring drought and bringing consistency and evaluation across the entire country is critical to the better preparation and response to drought as reflected in the Drought Monitor. While drought, by its nature, is a slow-moving event, the situation on the ground can change quickly. As such, it is necessary to have the most up-to-date information when that development occurs. I would encourage efforts that allow submittal of additional credible information to the National Drought Monitor so the full extent of the drought can be properly reflected. We have heard from local constituents, particularly in Western Kansas, that the Drought Monitor often underestimates severity of the situation on the ground, and this can delay access to some emergency programs within USDA.

As has been mentioned earlier, the Ogallala Aquifer supports a significant amount of the Nation's food and fiber protection. As such, conserving and extending the life of the aquifer is critically important to both individual States such as Kansas and Colorado, but the Nation as a whole. For several years, USDA's Agricultural Research Service, led by Bushland, Texas, has been active with research universities and in the Ogallala States to coordinate research in areas of monitoring, crop research, water management, and others. I would encourage the Subcommittee and Congress to provide adequate resources to expand the ongoing research into other areas and topics.

As our water resource declines, producers will need to adapt and move to alternative crops to continue the economic activity that has been vital to the area. Additional research is needed to better understand how to make that happen, as well as development of additional markets and incentives to grow crops like milo, right—we call it milo as well—that use less water and are more drought tolerant. Crop insurance was mentioned in the last panel. I would like to highlight that as well. It is one of the most important and widely supported programs within the U.S. Department of Agriculture. Like most programs, there are improvements that can be made. One that has been highlighted and I would echo is that there appears to be lack of clarity on the need to continue irrigation of a—of a covered crop at a time when drought has effectively terminated its growth. Producers are often told that they need to continue to irrigate the crop until an adjuster can visit the site in person and confirm the crop is no longer viable. Whether this is a policy issue or an education issue is unclear. We have heard from USDA that that is no longer a policy issue, but it still happens fairly frequently. Additional education resources are needed and made available to both the insurers and the producers on how to deal with this situation. Putting water on a crop that is already died is in nobody's interest.

USDA Rural Development serves a critical purpose in our local rural water districts and small towns because droughts not only affect farmers and ranchers, but our small communities as well. One change that I think could be helpful in rural development is when a catastrophe happens and we have a drought emergency in a local community, Rural Development does have options available for either expanding or extending a transmission line or development of a new well. However, the caps and the time to get those resources often do not match up with the ability of the local community to pay or the situation that is happening on the ground and the need to respond quickly. I would encourage the caps to be increased, the covered practices to be expanded, and the red tape be reduced so that we can get that money to the people that need it more quickly.

In summary, addressing the impact of drought across the High Plains takes all of our efforts. Whether it is the Federal, State, and local governments or individual producers, it takes all of us to work together to find solutions that are going to serve our farmers, ranchers, and local communities. I appreciate the opportunity to be here and be happy to answer questions.

[The prepared statement of Mr. Lewis can be found on page 114 in the appendix.]

Senator BENNET. Well said. Thank you, Mr. Lewis. Mr. Janssen, you are next.

STATEMENT OF MR. PATRICK MILAN JANSSEN, PRESIDENT, KANSAS WATER PACK, KINSLEY, KANSAS

Mr. JANSSEN. Okay. I did not disclose this in my bio, but I am a member of PETA, and that stands for People Eating Tasty Animals.

[Laughter.]

Mr. JANSSEN. All right. I have been asked to speak to CREP initially. CREP has met its initial goals in water-stressed areas where we had already experienced depletion in aquifers.

Senator BENNET. Could I ask you just to lean in a little bit to your microphone? Thank you very much.

Mr. JANSSEN. Okay. The CREP Program has achieved its initial goals of going into stressed aquifers, stabilizing water quality and the water quantity available there. Since then, we have tried to move this program into areas that still had abundant water and were viable for irrigation. At that point, we started running into issues with funding. Currently, in Stafford County, Kansas, an acre of irrigated ground is worth $7,000 an acre. A comparable acre of dryland is worth about $2,400 an acre. That is a $4,600 spread in property value, and currently, the CREP price for that ground is $2,250 an acre, or about 51 percent of what the fair market value of that water is at an auction.

Other issues we have got is presently, we do not have a dryland CREP option in Kansas. To sprawl this one a little bit, in the 1980's, in my part of the world, when the initial CRP Program came out, it effectively skipped a generation of producers because there was no place for those young people to go and farm to expand their family operations. I would urge a bit of caution there because CRP rental rates also impact what landowners expect to receive for ground that is still in production, so that can be an unintended consequence of that.

OK. We also have no option in CREP for partial water right retirements. We really need flexibility in the type of covers acceptable for grass seedings, specifically on irrigated ground in sandy areas. We need the ability to be able to use established alfalfa stands as cover for these crops rather than going in on ground that no longer has access to irrigation water, destroying an existing crop, and then attempting to produce something else to stabilize and protect that land from soil erosion. I found out this week that to make any modifications at a dryland program to the CREP in Kansas, we now have to go through an environmental impact assessment. We continue to make things more complicated rather than making things simpler and easier to implement. Crop insurance, it is definitely necessary. We had a board meeting of a cooperative I serve on, and for the second year in a row, our wheat receipts are 30 percent of our 15-year average in our area, so maintaining crop insurance is critical to keeping a viable national food security.

We seem to be suffering from a disconnect in communications and culture within NRCS, and I do not want this to come off as I am down on everything they are doing because I am not. We have gotten away from our NRCS offices or NRCS policies being drafted by farm boys with a college degree who wanted to make things better. We now have biologists, people with other specialties, extremely intelligent people, but they do not have the boots-on-the-ground experience in production ag to go out and make the connection between a hillbilly like myself and what they hope to achieve on a wildlife management level. The rigidity of these programs continues to increase as the disconnect between program, policy, and producers has widened. There is more emphasis placed on the proc-

ess rather than on the outcomes. There are many ways to reach a destination, and there are no straight lines in nature.

If I cover up the timer, I can ignore it.

[Laughter.]

Mr. JANSSEN. I would encourage a lot more producer-level input, you know, focus groups, things like this. We do not necessarily need to drag gentlemen, such as yourselves, into it, but you guys need to hear from those of us on the ground who are trying to implement these projects. One of the other things I keep hearing is cover crops, things like that. If a producer has tried that on their own and reported that to NRCS as is acreage planted to a cover crop, they are no longer eligible for cost share because that is a preexisting practice. If they want to expand that practice on their property, you know, neighbor Joe who is still dragging a mold board, he can get the funding, but the person that is progressive cannot, and that carries through in a lot of programs.

I guess I would ask as a group, NRCS, USDA, to establish a spirit of cooperation rather than a spirit of strict administration moving forward. That is my testimony.

[The prepared statement of Mr. Janssen can be found on page 119 in the appendix.]

Senator BENNET. Thank you, Mr. Janssen. Thank you very much for being here. Senator Simpson, please finish out the panel, and then we will have some questions.

STATEMENT OF MR. CLEAVE SIMPSON, GENERAL MANAGER, RIO GRANDE WATER CONSERVATION DISTRICT, ALAMOSA, COLORADO

Mr. SIMPSON. I am going to go ahead and cover up the timer right away.

[Laughter.]

Mr. SIMPSON. Thank you, Chairman Bennet and Ranking Member Marshall.

Senator BENNET. You guys have all been so good that we are in good shape, so take the time you need, and do not feel a lot of pressure.

Mr. SIMPSON. Thank you again, Chairman Bennet and Ranking Member Marshall.

So like some of the other members, I want to offer a little bit of a personal perspective. I am here as the Rio Grande Water Conservation District general manager, and we run a CREP Program, but you touched on it in the bio. I am the fourth generation of my family to farm and ranch in the San Luis Valley. I feel very blessed for the opportunity. On a daily basis, I get to farm and ranch with my dad, who is 81, and my 33-year-old son, and I got a little three-year-old grandson as well. It is important to me that we manage this new paradigm shift appropriately to give my son and my grandson an opportunity to be the fifth and sixth generations of my family to do this.

I operate a farm in the driest part of Colorado. We get less than seven inches of precipitation a year, so all of that—my community is the San Luis Valley. All of the culture, economy, and the communities are driven around irrigated agriculture, and the supply of water is just diminishing over, really, the last 20 years. My farm,

I utilize surface water diversions out of the Rio Grande and groundwater from a confined aquifer system, very similar to what my dad and my grandpa did. Uniquely, my surface water priority is an 1879 priority. You would think, man, that is—that is pretty good, that is senior. Not in my basin. That is like a junior water right.

I looked this morning, and that water right is now, this morning, the calling priority, which means it is not getting its full diversion. If the river drops another a hundred cubic feet per second——

Senator BENNET. Amazing.

Mr. SIMPSON [continuing]. that water supply is off. I have acres on my farm that solely depend on surface water, so it is done with its irrigation. The rest of the year, I am just subject to whatever natural precipitation we can get.

My wells were drilled in the 1960's, and, historically, they have been a steady supply of water, but it also is challenging in that a whole history of—you know, the doctrine of prior appropriation and us pumping water in the Valley, truly out of priority. There were ways to mitigate that over time, but it really has culminated, and I will touch about that in a minute. The San Luis Valley is about 8,000 square miles and about 500,000 irrigated acres, and it is recognized as highly over appropriated. The surface water was over appropriated by 1900. The groundwater were really over appropriated by 1970 and early 1980's, and the Colorado Supreme Court has affirmed that. There is no unappropriated water left in the San Luis Valley.

A highlight: 2002 was really an inflection point for us. It is the driest year in recorded history on the Rio Grande River. We have the second oldest continuous gauged point on the—in the State of Colorado on the Rio Grande at del Norte. Historically, that flow averages between 700,000- and 800,000-acre feet of water a year. In 2002, it was 135,000-acre feet of water. Really, from that point forward, we are—we are now 22 years post-2002, and 2018 was the fourth worst drought in our recorded history, and we just continue to be well below average in snowpack and runoff over that 22-year year period.

What that really led us to was instrumental in the Colorado General Assembly in 2004 was Senate Bill 222. This was a bill that directed the State engineer to craft rules and regulations about groundwater use in the—in Division 3 in the Rio Grande Basin that required producers to do really two things: remedy or mitigate the injury that your surface water withdrawals—I am sorry—your groundwater withdrawals have on surface water rights. Then uniquely, we are tasked with creating and maintaining sustainable aquifers in the Rio Grande Basin. Nobody else in Colorado was doing that. Really nobody in the Western U.S. was doing that in 2002. That really led us to a process to establish subdistricts of the Rio Grande Water Conservation District, tasked again with creating and maintaining sustainable aquifers. The first subdistrict to be formed was about 170,000 groundwater irrigated acres that came together to assess themselves fees to run programs, to create and maintain a sustainable aquifer system.

The centerpiece of that plan was CREP, the CREP Program, and I always kind of characterize it, it feels like to me, that CREP—

that program was really kind of written for the breadbasket of the United States, and we were trying to figure out how to utilize it, not for soil conservation efforts exclusively, but more about managing water and groundwater. It has been this odd kind of fit to try to take CREP and make it applicable to our groundwater situation.

When we started our efforts, the subdistrict came together and started managing for aquifer conditions in 2012 with the intention of, again, that centerpiece of CREP, identifying we could take 40,000 acres out of production voluntarily and compensated. Really, at that time period, if the next 20 years in 2012 would have looked like the prior 20 years prior to 2002, if we take 40,000 acres out, we can recover our aquifer to a standard that we set. We are 22 years into our—into our program. I am sorry. We are 12 years into our subdistrict program. We have not able to get 40,000 acres out of production. We are really, under the CREP Program, about 20,000, and I will highlight some of the, you know, circumstances behind that.

Commodity prices played a big role, and farmers do not get into this not to farm, and when high commodity prices occur, the CREP Program just was not competitive. It had regulatory challenges. Look, just dealing with the Federal Government is hard. I have had producers come to me and say I want to sign up for CREP, and I will say, all right. First process is you got to go down to Farm Services Agency because we are partnered with USDA and FSA and the Colorado Division of Water Resources to create this CREP Program. If I tell them they got to go to FSA, their immediate response is, I am not—I am not doing it. I do not want to do it.

Some of the other challenges some of the other folks have talked about as well, but having the flexibility and the uniqueness to adapt to our circumstances, whether it is the seed type we use, how much water we can put on it. payment limitations were challenging, uniquely alfalfa as well. We are trying to do this for water conservation efforts. Alfalfa is the most water-consumptive use crop we have. That is what I—that is what I raise as well. The CREP Program requires some sort of—you have to have rotated out of your crop within a certain window, a period—time period of time. Sometimes my alfalfa crops will go 10 years, and they do not qualify for the CREP Program.

I will—I will kind of finish up and wrap up since I am 2-and-a-half minutes over already.

Senator BENNET. I do not dare gavel you down.

[Laughter.]

Mr. SIMPSON. It is so important, and farmers are resilient. They are innovative in partnering with the Federal Government and the State government in trying to figure—this is not drought anymore. This truly is the aridification of the West, and I feel it on a daily——

Senator BENNET. Yes.

Mr. SIMPSON [continuing]. a daily basis on my farm, but some efficiencies. We can gain some ground inefficiencies, different crop types. I have heard others talk about it. I have—like Robert Sakata was pointing out, I am fortunate enough, I can assume an incrementally little bit more risk in my farming operations because I

have two other jobs. Growing a different crop, I have tried raising hemp for fiber. I am raising some barley under regenerative practices. I did not go buy a no-till drill, but that is in the cards. The other kind of key thing for us is the introduction of a conversation about groundwater conservation easements, and those have really come to fruition in my basin——

Senator BENNET. Got it.

Mr. SIMPSON [continuing]. and afford an opportunity for further discussion.

[The prepared statement of Mr. Simpson can be found on page 122 in the appendix.]

Senator BENNET. Let me—I am going to call—thank you for that, Cleave, and I will solve this problem by asking you my first question——

[Laughter.]

Senator BENNET [continuing]. which is could you talk a little bit about what the producers in the Valley are beginning to think about the use of groundwater conservation easements and how that could be a powerful tool for water conservation if we are able to figure out how to write some farm bill language that could support that.

Mr. SIMPSON. Thank you, Chairman Bennet. Great question, and this is a conversation really unfolded in the Rio Grande Water Conservation District. In 2019, I approached the conservation community and said, look, you have a great template and model for conserving and protecting surface values. Help me think about a model that what would a healthier aquifer system mean, you know, to both the surface values that you are—you are enduring to protect and the viability of agriculture here. It really set us on a path—and I know you have folks from Colorado Open Lands on a panel coming up—that really put us in a spot to really dig in, and for first of its kind two years ago, had a producer enroll his 12 center pivot systems, his farm into a traditional conservation easement that included a groundwater conservation component where there is a recognition of the value of him leaving the water into the aquifer and not pumping it out. It was a great collaborative effort to get this ball kind of rolling.

There is tremendous effort in the San Luis Valley, particularly if we can nuance it a little bit, to go maybe it is not a complete suspension of your groundwater withdrawals, but maybe a portion of it.

Senator BENNET. In my mind, this is a perfect example of what we are trying to get to in the conversations that we are having, which is how do we make these programs work better for the reality of the Western United States, not how they look on paper necessarily back in DC. We are going to need that kind of flexibility, we are going to need that kind of innovation, which brings me to my second question, and I am going to have a third one for you, Kate, after this. What do we do to get this dryland CREP moving, now moving away from Cleave's situation in the San Luis Valley to the situation, you know, we are facing more locally here in the Republican River?

By the way, we noted, we wanted to—yesterday we identified the fact that Republican is pronounced the same way in Kansas as it is in Colorado, unlike the word "Arkansas," which is——

Senator MARSHALL. "Arkansas."

Senator BENNET [continuing]. different in in Kansas. What can we do to help move this forward, do you think? Don, let's start with you, and, Mr. Lewis, happy to hear you, too, and there are three States that we have got here.

Mr. BROWN. Yes. We have got this three-State——

Senator BENNET. Lean into that microphone.

Mr. BROWN. Yes, I have got a—well, I do not have the answer. I wished I did. The bureaucracy is an interesting thing. When I tried to wade through it eight, nine years ago to open Colorado's CREP up in order to make—be able to use the irrigation well for domestic well, go from a hundred-acre feet a year to one-acre foot a year, DC pushed back big time because they thought on a bunch of these irrigated circles, we were going to use the water for apartment buildings. Apartment buildings in the middle of out here, right? That is the type of pushback we get with the bureaucracy.

I think that where you are headed is very helpful with your Improvement Act bill. I think that will help a great deal. One concern I have is the bureaucracy, I think to a certain degree, does not want this to happen. I think it is simple, and without Secretary Vilsack's help, we would not even have it today, and so I think that we will just have to continue to apply pressure. I do not understand what the reluctance is to conserve the Ogallala Aquifer. I do not understand what the reluctance is to keep young people on the farm by having ground-to-farm.

Let's talk about bureaucracy very quickly here. I want to show you a file from 1972 where my grandfather got an NRCS stock tank plus grass seeding. This is it. It is this thick. It is letter size, right? This is today's program, inch thick, and we have not got the project completed yet. I am anxious to see if I will need another one.

Senator BENNET. Mr. Lewis, do you have anything you would like to add?

Mr. LEWIS. Yes, I appreciate.

Senator BENNET. I will enter the thickness of the folders into the record, without objection.

[The document can be found on page ??? in the appendix.]

Mr. LEWIS. No, I thank you, and I agree with Don on this that the level of documentation, bureaucracy has certainly increased across all levels of government and across all agencies within USDA.

To answer your question, I think there are—there are two things. One is clarifying what the purpose of the CREP and CRP is really about. I think, as Don has correctly pointed out, I think there is a resistance to it because there is kind of a history of CRP, when it went in 1985, that is what it is really about. Well, times change and the resources we are trying to address change, and we need to be able to clarify to the leadership in FSA and USDA what that is about. There are other resources besides just making sure that we are keeping that soil in the same place it was.

The other thing is, I think, where is the decisionmaking point at? You know, we have, and this, again, is not only a USDA issue, it is a Federal agency issue. We have really good relationships with our State partners, our State conservationists, State FSA directors that really understand the situation on the ground, what we are trying to achieve, what our producers are facing, and they are often having to argue within their own agency at a higher level to try and get something done. I think if we can move decision-making point down a level or two to the people that are interacting with us on daily basis, we would get a better result.

Senator BENNET. Thank you. I have to gavel myself then because I am over time, so am going to actually go to my colleague for the next couple questions. I will come back to you, Commissioner.

Senator MARSHALL. Well, Senator Bennet, as I heard the interaction between Mr. Brown and Mr. Lewis, I was reminded that whiskey is for drinking and water is for fighting. What is so impressive, I think, since becoming a member of the Senate diving deep into these water issues is seeing the level of collaboration that I do not think has always been there, whether it is our State offices working together or the USDA. I think the CREP Act that two senators—two Democrat senators from Colorado and two Republican senators from Kansas—have tried to sit down, as Mr. Janssen suggested, with the producers, and figure out how do we take something and make it better. That is exactly how legislation is supposed to work, and we sure hope we make it—we hope that makes it into the final farm bill. It is not perfect. Maybe we got time to make it better, but I certainly am proud of the work that we have done.

I want to ask Mr. Lewis a little bit about the Rattlesnake Creek Basin, and just for the edification of folks back in DC, that Stafford County is also home to Quivira Wildlife Refuge, a wetland of international importance for many, many reasons, something that I have enjoyed for decades now. On the other hand, 80, maybe 90 percent of the economy in Stafford County is dependent upon irrigated corn and raising a little bit of cattle. There is—this is one of the best examples of something you and I have worked on and Mr. Janssen as well. What, in your opinion, could USDA do to help our producers in the Rattlesnake Creek Basin to solve this riddle?

Mr. LEWIS. Thank you, Senator Marshall, and I appreciate it. That is certainly a tough, tough issue for all of us to deal with. You know, certainly NRCS is already working with the local groundwater management district under a watershed plan to try and—to bring some resources to bear. Much like what was talked about with CREP, the environmental evaluation of that has been very significant and, I think, very costly. I think if we can try and speed that up a little bit, that would be helpful. Certainly the process, assuming that that moves forward, they are going to find something that is implementable. We need to be able to move that through the process very quickly so we can get those resources to the producers and on the ground quickly.

The dryland CREP option is—also overlaps with this area. Certainly, you know, directed funding, that maybe there is not a program that fits exactly, but we certainly have a very—as you point out, a very unique resource that we try to find some balance be-

tween our agricultural producers and the natural resource and the wildlife refuge. A lot of times there is not necessarily a program that fits very well, and I think we need some flexibility for some of our programs to make sure that we can come up with creative solutions.

Senator MARSHALL. Senator Bennet. Thank you, Mr. Lewis, and I will go with Mr. Janssen now and kind of a followup to the same issue. Some producers are early adopters of technology and some not so much. I guess I have always tried to figure out, well, why, why that is because we are going to have to adapt some new technology in the Stafford County and this Rattle Snake Creek Basin to make this thing work, right? Is it—how much of it is the cost, and how much of it is just the bureaucracy of trying to check the boxes to implement this technology? Why do farmers, ranchers not adapt some of these technologies?

Mr. JANSSEN. A lot of the struggles we have had with the technologies, I have been involved in a couple of different grant and water technology programs over the years. Several years ago, we had—probably 10 or 15 years ago, we had John Deere Fontanelle. Everybody had moisture probes, and, you know, if you bought seed, if you bought a green tractor, you got a moisture probe, and they came out, they put them in, and at the end of the year, they came and took them out. Nobody did any producer education, nobody did any followup with them, so they kind of—some of the technology, due to lack of follow-through on the part of the people providing it, left a bitter taste in the mouth of some people.

Through our—the last grant I was involved with, with the Nature Conservancy in K State, we had 30 cooperators. We had 36 separate fields. One of the things we found out was that boots on the ground, meeting with those producers, spending time going through, you know, the probe data, going through their irrigation scheduling, those type of things, is critical to the success of any of these programs. What we discovered through that thing based on producer engagement, is we think that a culture of efficiency and irrigation is somewhere in the neighborhood of 40 percent mechanical. We can hang stuff on a pivot until it glows in the dark, and it is not going to make any difference until we make that breakthrough with that producer, that they start to engage and get interested in what we are trying to do with them. That is the challenge is, you are—you know, you are fighting 50 years of it worked for granddad, it worked for dad, why would I want to do anything different? We are in a—we are in a new world. We need to figure out how to do the same or better with less.

Senator MARSHALL. Thanks. A quick question for Mr. Lewis, and if you—maybe you should refer me to somebody else, but I sat down with a producer in the Eastern third of the State earlier this week, one of those young families that we are trying to keep in the farming business, right? He has some EQIP funds to build a terrace, but he has been waiting over a year to get a cultural assessment done. He would gladly pay for the cultural assessment, he wants the cultural assessment, but we have got maybe one person that can do that. What could USDA do or we do to empower the process and not let some of these assessments hold up the process?

Mr. LEWIS. Well, I am certainly not familiar exactly with that situation, but we have run into that situation in other places, and I think one thing that NRCS and others could do, there are certainly other folks that can do that work outside of State or Federal agency. As you say, if he is willing to pay for that, I think having a list of folks that they are comfortable that they—those folks know what they are doing, they would accept those results, then they can refer that to somebody locally to do that work.

Senator MARSHALL. Mr. Brown, go ahead.

Mr. BROWN. May I answer?

Senator MARSHALL. Please. Sure.

Mr. BROWN. We are quite—we are quite familiar with that in Colorado. NRCS in Colorado has the capability of fulfilling the cultural resources component of the evaluation. If you are putting in a pipeline, NRCS will come and evaluate that for you and with you, and then that box is checked. Farm Service Agency does not have the trained personnel or technicians that have that certificate, so you have to go outside of and hire your own individual to do that for you. It is a three-hour drive. It is difficult. It is quite expensive. I would think and I would recommend that FSA contract with NRCS to have the NRCS individual conduct that—typically, it is the same project anyway—conduct that portion of it.

Senator MARSHALL. Thank you. What a reasonable, commonsense solution.

Mr. BROWN. Just saying, right?

Senator MARSHALL. Thank you.

Senator BENNET. Thank you, Senator. I did have one more question for the commissioner. You mentioned RCPP in your testimony, which I do think has enormous potential but has fallen short of that potential in the rollout and seems to me to be a place where we simply have not been able to achieve what the legislative intent was. I wonder whether you could take a minute to talk a little bit, as long as time as you want, talk a little bit about the changes you would want in RCPP, what is it about, what is it about the partnership of Climate Smart commodities you mentioned earlier that seems to be working better, and how do we make the whole thing better for producers?

Ms. GREENBERG. Absolutely. Thank you. I think you have heard up here actually a lot of the conditions that we would like to see change in RCPP when it comes to administrative burden. We have talked a lot about that. We see that as a significant barrier in RCPP projects. The intent behind RCPP, I agree, is admirable and, I think, very applicable, especially the focus on regional scale, focus on partnerships, but that administrative barrier is immense for a lot of organizations to participate. Also, the lack of administrative costs included in the program, the overhead, the commitment—the 5-year matching commitment. Looking at relaxing some of the matching requirements is certainly something we have heard would be very beneficial

Something we have seen across the board, of course, are project delays. This is out of our hands in some regards, but I think it is key that our Federal programs stay focused on keeping the timelines. Even if we are pushed back 18 months, 2 years, we see an incredible increase in costs that can make those projects very

difficult to implement given that time. We have also talked a lot about technical assistance. That is another key piece for RCPP. Something we have seen with climate smart commodities, we have seen a lot of these changes in Climate Smart that have really eased the path to participating and to getting a lot of diverse and really important partners included in those projects. Making sure we are investing in technical assistance, both through USDA and local and regional partners, is key.

All of this, I think about, is our role to help absorb risk. Much of what we have heard today from producers across the State is the limited margins we have in ag, hardly any margins, so it is our role to really help absorb that as we look to change. RCPP can really do better by following what Climate Smart Commodities has done.

Senator BENNET. Good. Great. Well, what a fantastic panel. It is actually hard to believe that you were not preparing your testimony together. We deeply, deeply appreciate it. Thanks for being in Burlington today.

We are going to now transition to the last panel, and we are going to try to move as quickly as possible, but please be patient. Thank you very much.

[Applause.]

[Pause.]

Senator BENNET. Thank you. We are going to get started for the third panel and try to end as on time as we can. Thank you all—thank you all for being here today.

I will begin by introducing Mr. Curtis Sayles, a fourth-generation farmer and owner and manager of CFS farms in Seibert, Colorado. He and his wife, Carrie, bought their first farm in 1985 and currently own 5,000 acres of dryland farm ground on the Eastern Plains of Colorado. Curtis employs regenerative agriculture where they emphasize soil health practice while producing a variety of specialty and commodity grains. His farm also incorporates cattle to further improve their land and provide natural fertilizer for growing crops. Thank you for being here today, and we look forward to your testimony.

Mr. Carlyle Currier is the president of Colorado Farm Bureau and a fourth-generation rancher in Molina, Colorado, where he raises beef cattle, alfalfa, grass, hay, and small grains. Following his father's example, he quickly became involved in farm organizations to support the local agricultural industry, including the local Colorado Cattlemen's Association and Farm Bureau. Carlyle has extensive experience in water policy, representing the Colorado River Basin Roundtable on the Colorado Interbasin Compact Committee since 2006, and in that role was very involved in writing the agricultural portions of the Colorado Water Plan. I am grateful for the number of times he has come to visit in Washington in his official capacity, grateful that he is here today. Carlyle, I look forward to your testimony as well.

Ms. Sarah Parmar is the director of conservation at Colorado Open Lands, where she has led private land conservation work for over a decade. In this role, she has moved the organization to think and work strategically to align land conservation with water challenges. Sarah has also led the development of a technical guide for Colorado's land trust community on collaborative water sharing

agreements, and led a feasibility study on using conservation easements to enable voluntary, compensated reduction of groundwater. Her passion for Western land protection stems from her background growing up as the fifth generation on a cattle ranch in Southeastern Arizona. Sarah is the immediate past chair of the Colorado Conservation Easement Oversight Commission. Thank you for being here today, Sarah. We really appreciate it. I look forward to your testimony, and Senator Marshall will introduce the other two witnesses.

Senator MARSHALL. Well, I have the honor to welcome and introduce two more witnesses from Kansas. First is one of the living legends of the cattle business, a true pioneer in cattle, one of my mentors that has taught me so much about understanding the modern cattle business, Mr. Jeff Sternberger. Jeff grew up on a cattle and farming operation near Hardtner, Kansas, which is on the Oklahoma-Kansas border, on the Kansas side. Somehow we lost him to Oklahoma State University where he got a degree in ag economics, but that has not held him back. He has still been successful.

[Laughter.]

Senator MARSHALL. He went on to work for another great innovation team, the Farm Credit System, now over a hundred years old, another great partner for agriculture, and he was making production loans to Oklahoma farmers and ranchers. Today, Mr. Sternberger is the general manager and co-owner of Midwest Feeders at Ingalls, Kansas. Jeff and his lovely wife, Colleen, also own farming and ranching operations in Kansas and Oklahoma. Jeff has served as the president of the Kansas Livestock Association in 2014 when I met him, and he is a past member of the National Cattleman's Beef Association Executive Committee, and currently serves on the U.S. Premium board of directors.

The next young lady I had the opportunity to introduce, she is a budding superstar in agriculture. Amy France is the vice chair of the National Sorghum Producers, otherwise known as the milo folks, from Scott City, Kansas. She is the first woman to hold a leadership office position on the National Sorghum Producers board of directors in the organization's 68-year history. She has served the industry on the NSP board of directors since 2018. She and her husband, Clint, are third-generation farmers working alongside their oldest son on their family farm in semiarid Western conditions, mostly on the arid side, I think. They grow grain, sorghum, corn, wheat, and raise Angus cattle. Amy, welcome to you as well.

Senator BENNET. Thank you all for being here, and, Mr. Sayles, please kick us off.

STATEMENT OF MR. CURTIS E. SAYLES, OWNER AND MANAGER, CFS FARMS, SEIBERT, COLORADO

Mr. SAYLES. Chairman Bennet, Ranking Member Marshall, I was glad that Senator Bennet said we had plenty of time. I wrote down all my thoughts, did a read-through, and it was only 16 minutes, and I thought maybe I better whittle it down.

Senator BENNET. That is short for the Senate.

[Laughter.]

Mr. SAYLES. Anyway, I hope I do better. Thank you for letting me speak to you today on the tools and processes we have been in-

corporating over the years to combat the erratic weather patterns that seem to becoming the norm. Our farm is entirely dryland. This means we do not irrigate any of our crops, so we are completely at the mercy of nature for our moisture. As stated before, I am fourth-generation farmer from Seibert, Colorado, just about 30 minutes west of here, where we are today. I returned to the family farm in 1980. I married my beautiful wife in 1982. She is with me today. Thought I better mention that. We have three lovely daughters, two great son-in-laws, and six charming grandchildren.

We purchased our first farm in 1985, practicing conservation tillage, meaning leaving as much residue on the surface as possible. 1997, we decided to pursue a no-till farming system, sold all of our tillage equipment, bought a sprayer, no-till drill, and started continuous crop zero till. At that time, soil tests indicated that our soil organic matter was less than 1 percent. In 2014, we were introduced to this new regenerative agriculture at the No-till on the Plains conference. By this time, our soil organic matter had increased to 2 percent over the years of zero till. In addition, our fertilizer recommendations continued to decrease as nutrient cycling matured.

As we looked at the advantages of healthy soil over chemical and fertilizer, we decided to adopt the suggested regenerative principles. We were already keeping the soil covered and had minimum soil disturbance. We added cover crops and began integrating livestock into our cropping rotation. We now routinely score soil organic matter in the upper 2 percents with some fields exceeding 3 percent. Utilization of the Haney and PLFA soil tests indicate that our soil biological populations are increasing with a corresponding nutrient credit being created. We have utilized some government programs along the way. We were enrolled in the Conservation Stewardship program in 2015. Unfortunately, this program was not patterned for large-scale utilization and did not fit our scale.

In 2016, we were introduced to Dr. Meagan Schipanski, a researcher from Colorado State University. Her team wanted to study the holistic system that we were building from a system-based approach instead of the traditional research model. This research was invaluable. Following this project, we were enrolled in the Farmer Advancing Regenerative Management Systems program, FARMS for short. This was funded by a USDA NRCS grant. This program supported producers who were building comprehensive soil health management systems on their farms. Last year, we were asked to participate in another program. It is a Western SARE grant-funded project called Farms Beyond Yield, helping indigenous and black farmers understand and utilize regenerative techniques. Last, we have been recently enrolled in an NRCS Transitional Organic Program. What we have learned from all of this is simply that the soil must have carbon—must have a carbon reserve if we hope to build resilience in our cropping system.

Earlier this spring, Dr. Jerry Hatfield, Agricultural Research Service senior researcher, addressed the 2024 High Plains No-till conference and shared that, most if not all, farmers in our region are now farming the B horizon. To quickly explain, the soil is divided into layers known as horizons. The A horizon is more commonly known as topsoil, while the B horizon is a more basic sub-

strate and so on. The topsoil is the rich, high-carbon layer of soil buildup over eons of natural processes long before man started tilling the soil. The topsoil layer functions as a whole ecosystem, the foundation of which is soil carbon. Tillage exposes this soil carbon to the atmosphere and triggers its loss as carbon dioxide into the atmosphere.

In the High Plains, the intact short grass prairie had no more than 5 percent organic matter. In the hundred years since the prairie was broke, tillage agriculture has reduced the levels of soil organic matter to less than 1 percent. For many years, conventional tillage was the normal cropping system. It still is for farmers today. However, tilling the ground is a consumptive system, meaning the system is always being used up without the ability to rebuild the resource. Dr. Hatfield's comments really hit a note with me and likely resonates with other farmers who grow crops in the former Dust Bowl region.

Conventional cropping systems work, as indicated by successful producers in agriculture, but at what long-term cost? If we keep treating the soil like a growing medium without regard—without the thought of regenerating it, we will be locked into a spiral of increasing fertilizer and chemical usage. Without carbon in the soil, we are never going to have the resilience to moderate a changing climate. This has to be a philosophical change. I would like my legacy to be a farm where I watch my grandchildren grow up healthy, I would like to not worry about them around the farm getting into something, and I would really like to pass on a farm that is not yoked to chemicals and fertilizer for productivity—for profitability.

Some areas need to be addressed as we move forward regeneratively. As we have heard several times today, Federal crop insurance must be modified to give incentive to farmers to adopt regenerative systems, increase the number of crops it covered. Non-traditional crops are discouraged if the farmer is forced to use the totally inadequate MAP Insurance System. Revisit the regulations concerning the usage of cover crop, maybe performance-based premium discounts for farmers incorporating regenerative practices, and, in general, the diminishing APHA issue will become a problem if the climate continues to deteriorate and crop insurance is used more often. Additional research is necessary. The research model needs to be a holistic, long-term, system-based research. On farm, in the real world. is the most realistic. A regenerative produce standard, much like organic needs, needs to be adopted. We are currently working with an organization called the Soil Carbon Initiative as they work toward this goal.

In conclusion, regenerative agriculture is a farmer-driven movement. That is why I think it will succeed. If society wants agriculture to go this way, government has a responsibility to assist. If our environment continues to track toward the erratic, farmers are going to have to adjust to protect the soil to continue to produce. That is the resilience we must foster. Drought resilience, economic resilience, and agronomics resilience must all be pursued. Thank you for letting me testify about a movement that I am passionate about. I have thrown a lot on the table. Maybe I have not provided solutions, but I hope I have suggested places to start look-

ing. I look forward to watching the results of this hearing. Thank you.

[The prepared statement of Mr. Sayles can be found on page 126 in the appendix.]

Senator BENNET. Thank you, Mr. Sayles. Mr. Currier, you are next.

STATEMENT OF MR. CARLYLE CURRIER, PRESIDENT, COLORADO FARM BUREAU, MOLINA, COLORADO

Mr. CURRIER. Thank you, Chairman Bennet, Ranking Member Marshall. My name is Carlyle Currier. I serve as president of the Colorado Farm Bureau, our State's largest general farming organization representing all four corners of the State and all commodities. I also serve on the board of directors of the American Farm Bureau Federation. I want to thank you for the invitation to participate in today's proceedings as we discuss the compounding challenges and opportunities ushered in by a dryer future and a more arid future.

I am the fourth generation on my family ranch located in Mountain Valley near Molina, Colorado. My son, Joel, will be the fifth generation to raise beef cattle and grow hay and small grains from our home in Mesa County. In my volunteer capacities, I have been fortunate to work with many groups intent on finding adaptions to hotter, drier times. The need for innovation becomes increasingly urgent with each drought cycle. Here in Colorado, our farmers and ranchers have adapted because wind and water supplies have demanded it. Where I am from, our high-elevation pastures are often flood irrigated. Our producers have improved efficiencies in flood irrigation over the years, and, in doing so, we provide a couple of important low-cost tradeoffs for the irrigation water we use.

For example, we slow water down and provide water for downstream ecological benefits like water for wildlife and shallow mountain aquifer recharge. We also benefit downstream users. This tradeoff provides consistency whether we are talking about our role in delivery through Colorado River Compact compliance or sustainability of our ecosystems. We produce the most nutrient dense, consumable, and affordable protein in the world. Our ability to use water to grow forage that we feed the livestock results in dividends that shore up our food security issues domestically. The insurance tradeoff need to not be dismissed. Additionally, farmers and ranchers in the West play a critical role on Federal lands to improving range conditions, preventing wildfires, and maintain health—maintaining healthy watersheds through grazing. Ranchers with Federal grazing permits utilize land that is often ill suited for other kinds of production.

Because we are here to talk about water, I would like to offer that, specifically, grazing on Federal lands increases water yields, improves soil structure, and assists with water storage and filtration. A strong partnership between Federal agencies and local grazing permits is key to maintaining these ecosystem services. I have been fortunate enough to have a good working relationship with personnel in Grand Mesa National Forest where I run my cattle in the summertime. Again, they recognize the important tradeoffs and

contributions of multiple use on Federal lands as opposed to an exclusionary preservation system.

There are many other ways agriculture is part of the solution for a future we are facing. Our continued contributions depend on the continuing respect for our State's administration of water rights and the private property protections that the prior appropriation system provides. Often, this system creates tensions between growing urban centers that need water resources and an agricultural industry that may be hurting during difficult times. Buy-and-dry programs as a stopgap for conserving water during periods of peak urban municipal expansion has severe consequences. Buy-and-dry imperatives do not bode well for a State's economy that depends on agriculture's $9.2 billion of sales contributions. We at Colorado Farm Bureau think buy-and-dry programs are to be cautioned against because of the consequences to our rural communities and economies.

USDA is certainly recognizing the importance of rural investment when it comes to helping farmers in rural areas experiencing distress from drought, but there is surely more we can do. We need solutions that fuel long-term economic development and provide multiple benefits like Senator Bennet's Healthy Watersheds and Healthy Communities Act. I recently heard our Colorado Congresswoman Caraveo say, when speaking about our Nation's transition to renewable energy sources, that it must make sense for farmers' and ranchers' economic bottom line to be successful. I believe that is equally true when we talk about management of our water resources. I agree there must be a balance between resources and stewardship and economic viability. If farmers and ranchers are expected to take the risk of modifying with new precision and conservation technologies, there must be incentives. The Healthy Watersheds and Healthy Communities Act provides commonsense incentives that leveraging Federal investment against private and public partnerships provides.

As a founding member of the Colorado Agricultural Water Alliance and past chairman, I know intimately the needs of water are diverse, and we must avoid a one-size-fits-all approach to water resources and water rolls. By simply reducing cumbersome paperwork requirements and streamlining ideas, CAWA-secured funding from the Colorado Water Conservation Board, and support a diverse group of water projects, all with the targeted objective of drought resiliency. They gather data from respective projects and are now leading the way in solutions that we know will help us through this hotter and drier future. They are varied in methods, but the projects, in shapes and sizes and duration, they are all part of the equation.

We must have more permanent funding for current and ad hoc disasters, and my written comments will tend to talk a little more about those. I will move on and just thank you for your time today and opportunity to contribute to this discussion. I hope that you will consider myself and the Colorado Farm Bureau as a resource when it comes to ideas to help protect and support our Nation's resources and rural communities.

[The prepared statement of Mr. Currier can be found on page 130 in the appendix.]

Senator BENNET. Thank you, Mr. Currier. We will keep your complete record or complete statement in the record. Thank you for that very much. Mr. Sternberger.

STATEMENT OF MR. JEFF STERNBERGER, OWNER AND GENERAL MANAGER, MIDWEST FEEDERS, INC., INGALLS, KANSAS

Mr. STERNBERGER. Chairman Bennet and Ranking Member Marshall, thank you for allowing me the opportunity to testify today. My name is Jeff Sternberger, and as Senator Marshall mentioned, I am the general manager and co-owner of Midwest Feeders Incorporated, located in Southwest Kansas near Ingalls. I am the past president of the Kansas Livestock Association, a member of the KLA Water Committee, a member of the National Cattlemen's Beef Association, and I also serve on the board of directors of U.S. Premium Beef, a producer-owned, vertically integrated beef system. My wife, Colleen, and I also own farming and ranching operations in Kansas and Oklahoma. I do have a bachelor's of science degree in agricultural economics from Oklahoma State University, and I am proud of it.

[Laughter.]

Mr. STERNBERGER. Midwest Feeders is a 90,000 head custom cattle feeding operation. The majority of the cattle owned in our feed yard are owned by other cattle producers. Our team provides feed and animal care during the finishing phase. While we raise some of the forage and grain needed to feed the cattle in our care, the vast majority is purchased from farmers in the region. My testimony today will focus on our efforts to conserve water.

The primary source water source in Southwest Kansas is groundwater from the Ogallala Aquifer. Depletion of the aquifer has received considerable attention in the last few years. As stakeholders have developed a better understanding of the rate of depletion, discussions around water use reduction and conservation have accelerated. While efforts have accelerated recently, our operation has been implementing practices to use water more efficiently for many years. These efforts go back 30-plus years as irrigation and water rights were converted to stock water rights. These water rights were exercised using flood irrigation technology. Water was conserved simply by shifting away from the less efficient flood irrigation system. Converting water rights from irrigation to stock water also results in reduced water use.

In 2018, we enrolled multiple water rights in a water conservation area, or WCA. The WCA allowed us flexibility in how we utilize our water rights in exchange for reducing our historical water use by 10 percent. The flexibility allowed us to more efficiently use water from multiple rights in our integrated system that supplies water to the cattle in our feed yard. In 2019, we completed an expansion that added additional capacity to our feed yard. As part of that expansion, we installed a water recycling system that captures overflow from the waters in part of the feed yard. The water savings from the recycling system has averaged between 1 and 2 gallons per head per day. For comparison, our typical water consumption across the feed yard averages 9 to 10 gallons per head per day. We completed another facility expansion in 2022 that included an-

other recycling system. We have seen similar water savings in that system as well.

The investments we have made allowed us to use water more efficiently. That is essential to the long-term viability of our operation. Our viability also is dependent on the forage and grains produced by farmers in our area. Last year, we began meeting with neighboring farmers to discuss the potential of extending water conservation efforts to farms in the area. We believe there is potential to use a WCA or LEMA to realize water conservation while still providing the revenue necessary for the farming operation and growing the forage and grain we need in our cattle feeding operation. If we are successful, we know other feed yards will take a similar approach in other areas.

We have been fortunate to be able to make significant investments in our operation to achieve water conservation. From a policy standpoint, support from the Federal level will accelerate investment across cattle feeding, dairy production, and farming. I suggest you consider cost share programs and tax credits as options that would support investment in technologies that provide water savings. The upcoming farm bill discussion would be an opportunity to expand conservation programs to include these types of investments.

Thank you again for the opportunity to testify today.

[The prepared statement of Mr. Sternberger can be found on page 137 in the appendix.]

Senator BENNET. Thank you very much, Mr. Sternberger. Thanks for being here. Mrs. France. Thank you.

STATEMENT OF MRS. AMY FRANCE, VICE CHAIR, NATIONAL SORGHUM PRODUCERS, SCOTT CITY, KANSAS

Mrs. FRANCE. Thank you, Chairman Bennet, Ranking Member Marshall, and members of the Subcommittee for the opportunity to speak at today's hearing. My name is Amy France, and my family and I farm and raise livestock in Western Kansas. We primarily raise grain sorghum—milo—corn, wheat, as well as Angus cattle. I also serve as vice chair of National Sorghum Producers, a/k/a milo.

As third-and fourth-generation farmers in Western Kansas, we live with the impact of drought and limited water resources with firsthand experience of the importance of water conservation efforts in agriculture. Today's hearing provides a great opportunity to discuss water conservation and, more importantly, the need for irrigation water savings to protect the Ogallala Aquifer. First, I want to express my gratitude to Senators Bennet and Marshall for your bipartisan leadership and commitment to agriculture at the Federal, State and local levels. The High Plains is a harsh climate that includes limited precipitation and extreme temperatures. Precipitation falls short of evaporation rates, leaving areas in the Western U.S. in a moisture deficit, and the U.S. Drought Monitor shows that. In Scott County where I live, it has consistently experienced drought conditions for the past several years.

Because sorghum is more efficient in the use of water than other crops, it is a key tool for enhancing the overall sustainability and profitability for my family farm. As the resource-conserving crop,

sorghum is a hearty, drought tolerant, high-residue crop that conserves soil moisture and reduces soil erosion. Despite the harsh and fragile nature of High Plains, the region still produces, on average, three-fourths of the U.S. sorghum crop under these challenging conditions. While USDA NRCS policy does recognize sorghum's contribution in a crop rotation, it should provide more compensation and greater incentives for resource-conserving crops such as sorghum.

I want to speak today about the importance of work being done at the local level organizations, like the Southwest Kansas Groundwater Management District Number 3. GMD3 has actively engaged with farmers in Kansas and neighboring farmers in Colorado, helping producers benchmark their irrigation efficiency against the other area producers, providing technical, educational and financial assistance to drive improvements and performance. Other GMDs have taken different approaches. For example, farmers under the Northwest Kansas GMD self imposed irrigation pumping guidelines. In the years following implementation, area farmers increased sorghum planting by over 400 percent, reduced water utilization by over 25 percent, and reduced water decline by 78 percent. In this case, crop choice was a vital tool for preserving groundwater and helping keep farmers farming. My groundwater management district, the West Central Kansas GMD, has implemented similar measures with results that double what expectations were at the beginning of the program.

We appreciate the efforts of Senators Bennet, Moran, Lujan, and Heinrich for introducing legislation that allows farmers to convert irrigated acres to dryland by placing their water rights into voluntary conservation easements. This creates water savings that are attributed directly back to the aquifer, helping to reduce over appropriations and to stabilize this important resource. From my perspective, Federal, State and local policies need to incentivize action which effectively deliver actual water savings in the Ogallala Aquifer. It is vital to preserve critical resources for agricultural, industrial, and municipal uses. Mr. Chairman, we can do this by adopting new technologies, improving practices and policies, and harnessing inherent attributes of lower water crop uses like sorghum.

With my time remaining for my testimony today, I would like to emphasize how critical it is that the Senate Ag Committee commit to farm bill reauthorization this year. The impact of lower commodity prices and high input costs coupled with prolonged drought in some areas make the need for update to the farm safety net more important. National Sorghum Producers has shown and offered its support in the framework released by Ranking Member Boozman earlier this month. Conversely, our analysis of the Democratic framework shows that sorghum and wheat industries actually lose significantly in the commodity support. We need a farm bill this year, not next year. The farm safety event hangs in the balance as well as farm families.

I want to thank you and the Subcommittee for your time today and for your proactive collaborative approach to these issues that are so critical for agriculture. Thank you.

[The prepared statement of Mrs. France can be found on page 139 in the appendix.]

Senator BENNET. Thank you, Mrs. France. Thank you very much for that testimony. Ms. Parmar, you have the last word. No pressure.

Ms. PARMAR. Oh, lots of pressure.

Senator BENNET. Then we will have some questions.

Ms. PARMAR. I am already terrified of the red button.

Senator BENNET. No, no, do not worry about it.

STATEMENT OF MS. SARAH PARMAR, DIRECTOR OF CONSERVATION, COLORADO OPEN LANDS, LAKEWOOD, COLORADO

Ms. PARMAR. Chairman Bennet, Ranking Member Marshall, members of the Subcommittee staff, thank you so much for the opportunity to be here to talk about the nexus between your work and mine. My name is Sarah Parmar. I am director of conservation for Colorado Open Lands. We are a statewide nonprofit that has worked for over 40 years to conserve land and wildlife—for land and water for people and wildlife, and since that time, we have conserved over 680,000 acres together with 720 associated water rights across the State of Colorado using conservation easements.

We have focused on irrigated agricultural land because we recognize that continued irrigation in rural communities is the cornerstone of the economy, ecology, and heritage that we all value. We recognize, as Senator Marshall so eloquently said earlier today, that issues of water are overshadowing issues of land and are critical, and that we as a land trust need to innovate our tools that we bring to the table for producers in facing these challenges. We have worked to adjust and adapt our conservation easements to add flexibility for water rights to combat buy and dry, and we have looked at ways to support aquifer recovery.

You heard from our illustrious State senator, Cleave Simpson, earlier today about the herculean challenges and matching efforts, I would say, of his home community in bringing their groundwater supplies into a sustainable level and avoiding a regulatory shutdown, a shutdown that would hurt economy and ecology equally. In 2019, we began working with Mr. Simpson and other really creative water managers in the San Luis Valley to explore whether we could take a traditional conservation easement and adapt it to support aquifer recovery, and we started with listening sessions because we wanted to understand what would work for farmers. What we heard from folks overwhelmingly was that there were so many people who want to be part of the solution, who want to do the right thing, but they are farming because they love farming and they do not really want to be paid not to farm. They want to be become compensated for reduction.

What came out of these conversations was this idea of a groundwater conservation easement, a tool that is both permanent and enforceable, a tool that qualifies for tax incentives and funding programs, a tool that can be tailored by region and actually by farm, and a tool that does not dictate how producers achieve those water savings on their own farm. Colorado Open Lands worked with the farmer to complete the first groundwater conservation easement, as Mr. Simpson shared, and the savings from this groundwater conservation easement will allow all of his neighbors, all of the other

irrigators in this groundwater subdistrict to continue in production, and will benefit wetlands on the nearby national wildlife refuge.

Now, we explored funding for groundwater conservation easements through the Agricultural Conservation Easement Program, but national headquarters staff had concerns about alignment of program purpose. We were instead encouraged to apply and were awarded a Regional Conservation Partnership Program grant. We have incredible staff working for the Natural Resources Conservation Service here in Colorado under the leadership of State conservationist, Clint Evans. We have significant experience implementing farm bill programs successfully, and I will say that we found it exceptionally difficult to utilize our CPP for conservation easements.

On the other hand, the Agricultural Conservation Easement Program is a known and trusted tool with staff who have real estate experience. I would advocate that the creation of a groundwater conservation easement program under ACEP, as envisioned by Senator Bennet in the groundwater—the Voluntary Groundwater Conservation Act that he sponsored last year, would create the necessary program purpose alignment for USDA and provide an impetus for the Agency to build expertise in water rights. The creation of even a pilot program in the upcoming farm bill reauthorization would enable NRCS and partners to undertake some of the necessary trial and error involved with the implementation of this program. By both highlighting the need to address water and integrating it into existing farm bill programs, you really give us as partners the ability to innovate alongside producers.

I would say that agriculture has always been an inherently risky occupation, much more about love of lifestyle than certainty of returns. I am the fifth generation to get to grow up on my family's ranch, and most of my childhood memories were wet playing in the creek, getting stuck on the road between our house and school, which was 30 miles away. Now I have incredibly difficult conversations with my father about how 2 out of the last 3 years were the driest that he ever experienced in his 50 years on the ranch. The well that serves my childhood home, the home that I hope to return to 1 day to take over management of the ranch, is currently dry. At 72 years old, my dad is still constantly working to find new ways to align his management of the ranch with what Mother Nature provides. He has not given up and neither can we.

Water is messy and it is complicated, but to solve the looming issues that threaten our agricultural industry, we have to be prepared to dive into that messiness and complexity, and we have to bring USDA in with us. I would argue that we need to facilitate reduction with production as we look to support producers and keep communities alive while we recover aquifers.

I want to thank Senators Bennet and Marshall for hosting this and for looking beyond bipartisan lines to really get to the heart of these issues and for asking how the next farm bill can support the innovation we need to create the resiliency in our communities. Thank you.

[The prepared statement of Ms. Parmar can be found on page 147 in the appendix.]

Senator BENNET. Thank you. Thanks for bringing us home. You did a great job. Sarah, I am going to actually start with you if that is all right.

Ms. PARMAR. That is all right.

Senator BENNET. As you know, we have been talking to USDA and to folks in DC about how to get this groundwater conservation program started. One of the things that I hear from USDA sometimes is that they are just saying that Western water law is just too complicated for them to be able to administer a nationwide program. I realize there are questions about maybe a pilot, not a pilot, but in the broadest sense, could you talk a little bit about that because it does—we do want our water law respected. We do not want it changed in any way by what they do, but I am worried that the attitude of throwing up their hands and saying it is just too complicated is not going to allow the creative people in the Valley, for example, to be able to achieve the benefits that you have described.

Ms. PARMAR. Well, I really appreciate the question, and I do not blame them for being intimidated. I believe that folks at USDA really want to ensure program integrity, and I appreciate that. I do think that there are ways to create national program criteria around monitoring and enforcement being required for implementing groundwater conservation easements. Being able to delegate the authority to the States, to the State conservationists who do understand the State law and the water regimes that they are operating within to be able to demonstrate how they can meet that national criteria of monitoring and enforcement, I think are very important. I think it is—it is very much possible, and I think that there are farm bill programs that we have talked about today that already rely on State water law or subject to State water law. I do not think we are paving totally new ground, but I think we have to try.

Senator BENNET. I do think that it is really important for us, when we think about the kind of easements that you are talking about and other conservation easements, that they are not tied up in the bureaucracy in DC where people may not know exactly what people on the ground are wrestling with or the expertise that the State and water districts and others have, so we look forward to continuing to partner with you on that.

Carlyle, I just cannot resist it because you are here, whether you know it or not, representing the Upper Basin of the Colorado River. I know you know it. Could you talk a little bit about what you and other producers have already done to cut back on water use in your operations in drought years? I know there are not a lot of big reservoirs in the mountains above where you farm. Just give the country a little bit of a sense of what it is like from a water perspective to produce at the elevation that you produce and that high up in the Colorado River Basin.

Mr. CURRIER. Well, thank you for the question, Senator Bennet. Yes, that certainly is a major issue as ongoing discussions on the Colorado River Compact and the protocol for operation of the river has not only allowed, but really encouraged, I think, overuse of the river in the Lower Basin by sending water down to Lake Mead and encouraging people to use that, even though it is creating a situa-

tion where the reservoirs are at crisis level. In the Upper Basin, we do not have that option. In my area, I am 100 percent dependent on annual snow pack, so we have a year with low snow pack, I do not have the water. It is not there. In 2021, I raised less than a quarter of my normal crop because I was out of irrigation water by this time of the year and could not—could not raise any alfalfa after that, and had to buy lots of expensive hay to feed my cows.

We are doing things to try to help with that situation by using water more efficiently. There have been a lot of proposed projects, some of the drought management projects that have been proposed as far as paying farmers to forego part of their use. You know, I think it is an important tool that that should be considered and should be tried. I do not have a lot of hope that there will be a lot of solution there, but if we do not try it, we certainly will not know whether it will work. You know, anything we can do to expand the availability of that precious resource of water, to use less of it for what we are doing with it and allow more for other uses, is certainly going to be a benefit.

Senator BENNET. Thank you. In the last few seconds that I have—take your time, Mr. Sayles—but you ended your testimony with such a hopeful sense of what the future could bring. I wonder if you could just talk a little bit at the end here about what we could do to the USDA conservation programs that you think would be most helpful to folks that were just starting out in or wanting to start out in regenerative practices, the kinds of conservation practices you described.

Mr. SAYLES. I think probably the most important thing would be continuing education. Anybody that is involved in a government program, especially if it is focused on regenerative ag, it should be a requirement that we have plenty of great conferences around. I think young guys need to—I think there is education thing. Another thing we learned through the farms program was a lot of times, young guys, of course, grandpa and dad are still on the farm. There is a lot of that is not how we have done it, we do not want to do anything new, yada yada. We even had some young guys say that their neighbors treated them different if they are doing these new things. I do not think the government can handle that. I think it would be better that the government incentivize programs like farms that allow the mentorship-mentee type of a deal.

Senator BENNET. Thank you. Thank you. Senator Marshall?

Senator MARSHALL. All right. Thank you. I want to spend my last few moments here talking about the terms "climate smart" and "climate friendly," and, in particular, how they are defined and being used by the IRA and the USDA. Mrs. France, what would you say to those in DC that say unless the conservation practice you implement on your operation of a greenhouse mitigation or sequestration effect, those practices are not climate friendly?

Mrs. FRANCE. Well, I would say farmers are the first to be climate friendly, and I will stand by that forever, but I would say one size does not fit all for climate friendly. You know, we heard about cover crops earlier, and for Western Kansas, as you mentioned in your opening, that just does not fit. Things that we have done is leaving stubble, and so what that does is that keeps the moisture in the soil. It helps with soil erosion. Although that is not seen as

a cover crop, that is certainly what works best for us, so we have to be very careful in defining "climate friendly" and making sure that term is widely encompassing all areas. My challenge would be putting a true definition to that to fit all regions.

Senator MARSHALL. Would you agree with me that agriculture is only able to use about 40 percent of that IRA conservation funding, and if it was opened up, that, indeed, there are some real practical uses agriculture could use that would make—that would indeed be climate friendly?

Mrs. FRANCE. Yes. National Sorghum Producers has publicly supported moving IRA funding into the conservation title. That just gives more runway for those funds to be put into growers pockets when they need them the most.

Senator MARSHALL. Then, Mr. Sternberg, I want to talk to you about climate smart practices. Can you describe how USDA has engaged with the Kansas Livestock Association to learn which livestock production practices should be included in this list of climate SMART IRA practices?

Mr. STERNBERGER. Yes, Senator Marshall. Thanks for the question. In a conversation with a KLA staffer, he indicated there was, oh, likely one cursory conversation with the USDA in regards to that in this past year. They felt like that they were overly focused on checking the box of—the appropriate box as far as climate change or carbon sequestration. It is my personal belief, and I believe that it is KLA policy, direction would be that they would be a lot more in favor of conserving our resources that we currently have. For example, in Western Kansas where we get less rainfall than we do in the eastern part of the State, we rely on a lot on the Ogallala Aquifer, and there are efforts there we could be doing to conserve that water to raise more crops for the livestock industry as well as making the farmers a lot more economically viable by doing so.

In the eastern part of the State, they are more concerned with water quality and rangeland health and focusing on programs like that. I feel like that if the American farmer and rancher are more focused on producing food more economically, we could possibly get a little better control over the food inflation that we have got in this country.

Senator MARSHALL. Thank you. Mrs. France, let's talk about the future. You have got three kids. Is that right?

Mrs. FRANCE. Well, blessed with two marrying into, and then have three of my very own, yes.

Senator MARSHALL. There we go. Talk about the future of agriculture. Where does conservation meet agriculture 30, 50 years from now? What are your children and grandchildren going to be doing that we are not doing today? What are you excited about?

Mrs. FRANCE. Well, to speak about my children now, our oldest son is running truck, my oldest daughter is running combine, my 12-year-old is running grain cart——

[Laughter.]

Mrs. FRANCE [continuing]. and my daughter is working as a teller, and then we will take meals at supper, so that is the generation right now, already hard in the field. They are very aware of what is coming down the pike. We talk about it. Even though we live in

rural Kansas, rural America where agriculture is the heartbeat, there are still many people that surround us that do not understand what it is going to take to keep agriculture moving forward.

We talk about the Ogallala Aquifer, and I can echo what Sarah is saying about, you know, wells going dry, and so when wells go dry, farming goes dry and cities go dry. That is a conservation that I am looking at is actually a personal conservation, keeping rural America alive, and that is keeping agriculture alive, and conserving that aquifer and doing all that we can do. It will look very different, I am sure of it, but these kids are anxious to keep on the tradition, and I am excited to see what they do.

Senator MARSHALL. Last question, I think is, we made it through a whole hearing and no one has mentioned high-speed internet. How important is that to conservation practices and the future of your farm and your family?

Mrs. FRANCE. It is everything. We can speak to it. You know, last year, we sat on—I believe it was 2022—sat on the side of the field because we could not connect to start planting, and so we lost valuable time. I actually mentioned to Sarah when we lost Wi-Fi and electricity, I said, welcome to Western Kansas/Eastern Colorado.

Senator MARSHALL. Yes.

Mrs. FRANCE. It is very vital. I do not know anything that works without it, and our kids are very fortunate to have what they do, but we keep saying, we are going to pull GPS out of your tractor and you are going to learn to follow the line so that when things go wrong, you can still farm.

Senator MARSHALL. Yes, but certainly to, to do the conservation practices today with precision agriculture more than ever, and that—all that precision agriculture leads to conserving water as well as using less inputs, less fertilizers, less pesticides, and we cannot do that without high speed internet.

Mrs. FRANCE. Absolutely.

Senator MARSHALL. Thank you.

Senator BENNET. Thank you. Well, thank you very much to the—to our last panel. It was just as fantastic. Let's give them a round of applause, too.

[Applause.]

Senator BENNET. Senator Marshall, would you like to say a word of closing before we wrap up?

Senator MARSHALL. No, again, Senator Bennet, I am just honored to be here with you and your commitment to leaving this world cleaner, healthier, and safer than we found it. As we went through the discussions, well, you know, what did we miss? I wish we had time for one or two more panels, and I think we would probably bring up some more people like Sarah, and I just want to thank my conservation partners in Kansas. The Nature Conservancy does a great job. Ducks Unlimited does a great job, Kansas Land Trust, Kansas Wildlife Federation, Kansas Gracing Lands Coalition, all those people that we kind of touched on today that are so important as well, so thank you to all those folks and their practices.

We did not talk about playas and I wanted to—I was hoping someone would bring those up, vitally important. I think that we have seen great progress in Kansas. There are opportunities here.

I think we need to emphasize that the playas and how we can take—set aside—if you set aside four acres of ply, it is going to recuperate an acre foot every year, and, again, we will be using less inputs. We will not be wasting fertilizer, and it is good for the—all the birds and all those things as well.

I think if I would have a message from today, it is that we have a plan. Sometimes we make it over complicated, but we need to use—take this simple plan and then implement it perfectly, and by "perfectly," it is going to be through volunteerism, but somehow bringing the other people aboard. I do not think we have really touched 10 or 20 percent of the conservation opportunities that are out there that have been—that are being—that could be implemented even further. I think that is our goal and our challenge is how do we be better educators. How do we better communicate the opportunities from a conservation standpoint? We cannot make it rain anymore, but we can certainly figure out better ways to conserve water.

I am honored to be here with you today and look forward to getting a farm bill across the finish line, and I think we learned, again, valuable information from today where we set our priorities. Thank you for having me and my staff.

Senator BENNET. Thank you. Thank you. Thank you, Senator Marshall. Colorado, let us give Senator Marshall a round of applause for being here today.

[Applause.]

Senator MARSHALL. Thank you.

Senator BENNET. Really appreciate your making the trip, and next time we will flip it. We will do the hearing over there. We will—we will—we will spend the evening over here the night before, but this has been really tremendous. I want to thank all the witnesses that have traveled here, the people that have come from across the States of Colorado and Kansas and the High Plains.

We have heard a story. I think if you listen to the people talking about the history of the region, that this has been a story of innovation from the very beginning. As Amy was just saying at the end, for her children, things may look very different, you know, years from now, but the important thing is they are going to still be on the land producing the food and fiber that we need. That is not going to happen without farmers and ranchers being able to innovate, but it is also not going to be able to happen without a USDA that can innovate as well in real time and in a way that can match the innovation of the producers that are facing these enormously difficult decisions and scarcity just like their forebearers did.

I think what I heard a lot today was not so much how new it was all going to be, but it is a—it is continuity of the innovation we have already had. We have got to bring that to bear in an urgent way in the—in the drought conditions that we are facing. I think part of what our challenge is, to make sure that the innovation here

can be calibrated by what is going on in Washington, DC, and that is where all of you come in. That is why your testimony is so important today. I think it is why it is important for you to stay in touch with Roger and stay in touch with me and the other members of the Agriculture Committee because that is where that syncing up is going to happen.

I agree. I think Robert Sakata said this very well at the very beginning. We have to figure out a way when margins are as thin as they are, to give people a chance to make mistakes along the way, too, and to learn from those mistakes. That is a very hard thing for anybody to do. It is a particularly hard thing for a bureaucracy like the one we have in DC to do. I could not be more grateful for all of you that made this possible. I want to thank, in particular, the witnesses for providing their perspectives today, Senator Marshall for your partnership both in and outside of the gymnasium back there in the Capitol.

To all of our fellow Subcommittee members that are not present today, I would like to tell them to please submit any additional statements or questions for the record to the committee clerk five business days from today, or 5 p.m. next Wednesday, July 3, 2024.

I also, on behalf of Senator Marshall, want to thank Chairwoman Stabenow and Ranking Member Boozman for their leadership of the committee. I know they have staff here as well, and we are grateful to have the chance to do this field hearing because I think it is really is an opportunity for the committee to hear directly from people here on the Eastern Plains of Colorado and in Western Kansas.

With that, I hope everybody travels safely this afternoon. Thank you very much for coming here, and thank you for all you do to keep our rural economy alive. We have a decision to make in this country about whether or not we are going to keep rural America, whether we are going to keep rural hospitals, and rural schools, and agriculture that is the backbone of our rural communities. I know Senator Marshall and I are committed to doing everything we can to do our part. Thanks for being here today.

With that, this hearing is adjourned.

[Whereupon, the Subcommittee was adjourned.]

APPENDIX

JUNE 26, 2024

COLORADO
Department of Agriculture

Written Statement of Robert Sakata
Agricultural Water Policy Advisor
Colorado Department of Agriculture
Broomfield, Colorado

"Hearing on the High Plains: Combating Drought with Innovation"

U.S. Senate Subcommittee on Conservation, Climate, Forestry and Natural Resources
Midway Theater and Cultural Event Center
Burlington, CO 80807

Wednesday June 26, 2024

Chairman Bennet, Ranking Member Marshall, and honored members of the committee,

Thank you for the opportunity to provide testimony for your hearing on combating drought with innovation here in the High Plains region of the United States.

My name is Robert Sakata and our family has a farm in Brighton, Colorado started by my father 80 years ago. In January of this year, I was privileged to start as the first ever Agricultural Water Policy Advisor at the Colorado Department of Agriculture, hired by Colorado Agricultural Commissioner Greenberg who will be speaking later today. I wanted the job because I am deeply invested in overcoming the challenges and exploring the opportunities facing our agricultural communities amidst increasing climate variability and prolonged drought conditions. Working with a wide variety of dedicated partners, some of whom will also be testifying today, I hope to be able to help Colorado's agriculture community adapt to these dry times. While we can make great strides at the state and local level, a strong commitment from our federal partners is vital for our work to progress successfully.

I am honored to lead off the discussion today and will start off by defining the problem and then will provide a broad overview of the challenges agriculture is facing that is contributing to the problem, which others will go into more detail on. Included will be some personal experiences on our family farm and observations in my new role with the Colorado Department of Agriculture. I will provide some startling facts and then conclude with some suggested actions.

What is the problem? The rapid decrease of irrigated farmland. The U.S. Department of Agriculture's (USDA) 2022 Census of Agriculture reveals that over the last 25 year reporting period, irrigated acreage in Colorado has decreased by 1,086,425 acres. That is a 32.2% reduction and accounts for 80% of the reduction of irrigated land across the entire United States[1]. I feel like the decline in irrigated agriculture in the arid West is reaching a tipping point that we need to act now before it is too late.

Colorado is what we refer to as a headwaters state. We have 158 named rivers flowing through the state, with all but the Green and Cimarron Rivers generating from Colorado's mountains[2]. 83% of the State's water use is based on surface water supplies from these rivers. The other 17% comes from groundwater supplies like the High Plains aquifer or the Ogallala, and the San Luis Valley aquifer. How we manage these water supplies is more important than ever due to a changing climate.

The High Plains region, known for its agricultural productivity, faces significant challenges due to recurring droughts exacerbated by climate change. These challenges threaten the livelihoods of farmers and ranchers, jeopardizing food security, and underscore the urgent need for innovative solutions.

Why is irrigated acreage decreasing so rapidly? We need to look at 4 major factors, (1) the changing climate, (2) the continued municipal and industrial growth, (3) the efforts to manage the state's important groundwater resources, (4) the limited financial resources available to most farmers and ranchers.

Climate Change: Today you will hear from climate experts describing the trends in our climate, as outlined in the Colorado Climate Center's Climate Change Report.[3] This change is creating a perfect "non-storm", increasing demands on our limited water supply due to population growth and rising temperatures.

Population Growth: The Colorado State Demographer's office report released in January 2024 indicates that although population growth has slowed down it is still forecasted to be higher than the national average. Looking further into their data the majority of growth is expected to occur in the counties with larger municipal centers while in particular, eastern agricultural-based counties may continue to lose population.[4]

[1] https://www.nass.usda.gov/Publications/AgCensus/2022/
[2] https://www.rivers.gov/colorado
[3] https://climatechange.colostate.edu/
[4] https://storymaps.arcgis.com/stories/c81462dd7bc44924b4876a4d016c1194

Managing Groundwater Supplies: Across Colorado, work is actively going on to ensure that groundwater and surface water supplies are managed sustainably, leading farmers to approach what they do in a different way. Major efforts are underway to reduce the pumping of groundwater wells in the Republican River Basin and in the Rio Grande Basin in order to achieve that goal. Farmers are changing management strategies participating in educational and technical programs like the Colorado Master Irrigators[5] , the Colorado State University Testing Performance Solutions, referred to as TAPS,[6] and grants looking at alternative low-water use forage crops, like sainfoin[7] and rye, in a project called "The Rye Resurgence Project"[8]

Limited Financial Resources: America's farm and ranch families and their dedicated staff work tirelessly to provide the food and fiber that we all need to survive. The U.S. consumer spent an average of only 11.3 % of their disposable income on food in 2022 according to the USDA Economic Research Service (ERS) allowing them to have the purchasing power to support the rest of our economy. And yet, even though food costs have gone up the last couple of years, the USDA ERS reports that only 7.9 cents of each food dollar spent goes back to the farm production![9] On our farm we have not only had to adapt to less water supplies by becoming more water-efficient, but we have also had to become more financially efficient, reducing our costs as much as we can just to survive. We have had to adapt and we keep adapting, which has meant growing less fresh vegetables and experimenting with water conservation practices.

Unfortunately farm families across the arid western United States are on the front lines battling drought and aridification. These challenges not only reduce crop yields and livestock productivity but also strain water resources critical for irrigation, domestic, industrial and environmental uses. They disrupt rural economies, increase financial instability among farmers, and heighten food prices—impacting consumers nationwide.

The State of Colorado has been a leader in the fair administration of water rights which is critical in times of water shortages. Water rights in Colorado and across the West are unique when compared to other parts of the United States. The use of water is governed by what is known as the "Prior Appropriation System". This system of water allocation controls who uses how much water, the types of uses allowed, and when those waters can be used. Amid severe drought, the fair administration of water rights

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[5] https://www.comasterirrigator.org/
[6] https://www.irrigationinnovation.org/csu-taps
[7] https://dnrweblink.state.co.us/cwcb/0/edoc/221419/17y.pdf?searchid=cda63f5b-f631-4f33-92bb-83c91565181d
[8] https://www.ryeresurgence.com/
[9] https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/food-prices-and-spending/

has been and will continue to be challenging, expensive, and painful for Colorado agriculture.

For example, on May 8th, 2006, the Colorado State Engineer ordered over 440 alluvial groundwater wells to be shut down in the South Platte basin in Northeastern Colorado because they were found to have insufficient augmentation plans, causing injury to downstream senior water rights holders. Our family farm had 4 wells that were red tagged and we were forced to look for alternative water, which during that drought period was impossible. Instead, we just watched as our crops withered away and died. It would have been easy for us to sell out and give up farming — and the pressure to do so is even greater today as our surface water rights are more valuable than the land we farm — but I believe in farming and the importance of it to our society.

A critical partner in this work is the Colorado Division of Water Resources whose job it is to allocate our water resources based on our prior appropriation system as they continue to expand their measurement capabilities across the state. As water rights are changed from agriculture uses to municipal and industrial uses, the job of administering water allocation has become more and more complex. New innovative programs like the Colorado Airborne Snow Measurement (CASM) Program, which uses LIDAR measurements to help forecast the yield of water from snowpack, can help us better manage the limited and variable water resources we have each water year[10].

Also reported in the 2022 USDA Ag Census is that input costs for farmers and ranchers are skyrocketing. Increasing labor rates, a shortage of seasonal housing, higher feed, seed, and fertilizer costs to name a few. On top of that are all of the uncontrollable challenges associated with farming and ranching, including hail, flooding, drought, wind, commodity market fluctuations, and supply chain disruptions. Farmers can't afford to take on another risk of modifying their operations with the risk of no return. As a personal example on our farm when we switched from growing fresh vegetables to feed crops for our local dairies, it gave us the opportunity to move away from intensive soil tillage practices. We bought a new planter and strip-till machine to be able to incorporate reduced tillage into our operation at a cost of $183,572.06. The first season we implemented reduced tillage using this new equipment, almost all of our pinto bean crop was a failure, and we didn't make enough money to pay off the loan for that investment. I am happy to report that we are now using that machine more successfully, and we were very fortunate to eventually be able to recover from those losses mainly through the sale of our vegetable farming equipment. But many operations are not as lucky.

I am very proud to farm in a state that cares about farmers and ranchers, the hard work we are doing as stewards for our land, animals, water, families and staff. The most

[10] https://coloradosnow.org/

recent Colorado Department of Agriculture public attitudes survey reports that 98% of respondents agree that Colorado's food and agriculture industry is important[11]. This is especially surprising considering that according to the USDA Economic Research Service Data only 1.2% of U.S. employment was directly on the farm[12]. Although most people don't have a direct or personal connection with farms anymore they have a vague understanding of how much farmers and ranchers do to support the way of life they enjoy. I think we need to find more ways to compensate our agricultural communities for the critical work they are so dedicated to.

My new role has provided me the opportunity to travel across the State of Colorado and participate in some of the numerous water conversations going on. This includes the nine Basin Roundtables across the state, Water and Soil Conservation Districts, Colorado Counties Inc., Councils of Governments and Chambers of Commerce and Tribal consultation. It is truly amazing to hear about and see the wide range of innovation by farmers and ranchers with their limited resources, some of whom you will hear from later today.

I would also like to highlight the efforts of the Colorado Water Conservation Board (CWCB) to support these efforts. In the recently updated Colorado Water plan, one of the four "Visions for Colorado" is for *Robust Agriculture* along with *Vibrant Communities*, *Thriving Watersheds*, and *Resilient Planning*. The updated plan adopted by CWCB in January of 2023 was a result of an extensive two-year outreach effort and work by the nine Basin Roundtables, and discussions with a variety of other stakeholders across the state. It serves as a framework for statewide collaboration around water planning and includes the 50 partner and 50 agency actions to support the Visions[13]. In appendix A are the action items of the "Colorado Water Plan" associated with the support of Robust Agriculture.

When it comes to Colorado agriculture, one size does not fit all, which is a major challenge when applying for federal assistance programs. In Colorado our short growing season provides its challenges, but it also offers benefits. As a vegetable farmer I would welcome the subzero temperatures in January because it was killing lots of the bugs and I would see less pest pressure the coming growing season. Of course I felt compassion for the cow calf operators who would struggle with the cold temperatures caring for their animals.

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[11] https://ag.colorado.gov/markets/publications/public-attitudes-survey-2022

[12] https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy.aspx

[13] https://cwcb.colorado.gov/colorado-water-plan

As a former board member of CWCB, we often heard how challenging it was to garner federal funding. The most successful programs I have seen in Colorado are the efforts that are led at the state or county level because they know the local needs and can simplify the process. Most of us farmers and ranchers don't have the knowledge, time or expertise to apply for federal programs or grants. A prime example of a local effort that is working is a grant the CWCB provided to a grower-led group called the Colorado Agriculture Water Alliance (CAWA) for a grant titled, "Ag Drought Resiliency Program". The CWCB awarded CAWA funds to essentially go out to the farming and ranching communities to look for ag partners that wanted to try new practices and test new ideas to help with drought resiliency. CAWA made it extremely simple for the producers to apply and then CAWA essentially did all of the paperwork to secure the funding. Some of the test projects didn't work, which is probably more important to know what doesn't work and why supporting this work financially is so important so that other producers don't make the same mistakes. Another important premise for this work is how important peer to peer learning is. Oftentimes us farmers watch what our neighbor is doing much more closely than anything else.

In conclusion, I feel it is important for our Federal partners to consider:

1. The allocation of additional resources for local research, development and application of drought-resistant technologies and practices for the arid west;
2. Support of local programs that incentivize sustainable practices;
3. Investments in improving aging water infrastructure; and
4. Expansion of outreach programs that include all types of water use.

The goal of having a resilient and adaptive farming and ranching system across the arid west is a task that is of utmost importance and one where all of us need to work together. As the Agricultural Water Policy Advisor for the Colorado Department of Agriculture I am committed to work with our Tribal, Federal, State, and local governments, as well as collaborate with academic institutions, farmers and ranchers, their communities, and conservation partners across the state of Colorado and across the region. By investing in innovation, promoting sustainable practices and strengthening resilience I am optimistic that we can mitigate the impacts of drought and ensure the long-term variability of Colorado agriculture.

As you continue your important work on crafting policy solutions for drought, I hope that you commit to supporting the important and valuable locally led initiatives like those in our Colorado Department of Agriculture and our conservation partners across the state that you will hear more about today. I sincerely feel that local expertise, knowledge and

dedication have the best opportunity for developing successful programs — programs that will help us transition to and withstand a more arid climate.

The strength of Colorado agriculture is our diversity. Whether it is the high elevation pastures that are flood irrigated and then support the environment by slowing the water flows for downstream ecological functions later in the season, to highly efficient drip irrigated vegetables, each has an important role. I hope that we can recognize the importance of this diversity and the need to support our local farmers and ranchers in light of the recent COVID-19 pandemic and the risk to our society when the supply chain relies too much on the fragility of a single source

Thank you for the opportunity to provide comments today and please feel free to reach out to me anytime if you have any questions, comments and especially with ideas of what we can be doing to support our farm and ranch families. Thank You.

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Appendix A: Colorado Water Plan Actions for Robust Agriculture

10 agency actions listed under the Robust Agriculture section:

2.1 Expand agricultural water conservation, education, and peer-to-peer programs that enhance innovation
2.2 Integrate capacity building efforts to support agriculture
2.3 Expand the scale of collaborative water sharing agreements
2.4 Streamline collaborative water sharing agreement guidance across agencies
2.5 Support the integration of robust agriculture into local government planning
2.6 Assess the economic opportunities of avoided buy and dry to communities, ecosystems, and recreation
2.7 Engage federal and state partners to streamline assistance for groundwater dependent regions
2.8 Streamline agricultural infrastructure funding
2.9 Assess agricultural impacts and best practices for water quality protection
2.10 Integrate soil health, water conservation, and adaptive practices that increase economic outputs with less water use

Colorado Department of Agriculture partner in other Vision Action items that include:

1.4 Coordinate funding opportunities for conservation, safety, and aging infrastructure
4.1 Create a capacity-building hub to provide accessible educational opportunities
4.5 Convene workshops on water and climate vulnerability, adaptation, and resilience
4.6 Develop an interagency framework for increasing grant funding access and opportunities
4.9 Create innovation challenges and explore an innovation accelerator
5.7 Strategically fund the Colorado Water Plan and find opportunities to leverage funding
5.8 Identify collaborative survey efforts

“Partner” actions for agriculture include:

1. Thoughtful Storage
    a. Storage to protect and enhance existing agricultural uses under an uncertain future
    b. Storage to provide supply and flexibility for augmentation plans
    c. Strategic and smaller storage facilities that meet multiple needs
2. Meeting Future Water Needs

   a. Rehabilitation of agricultural storage facilities
   b. Replacing old diversion structures
   c. Installation of modern water measuring equipment
3. Water Wise Use
   a. Conveyance efficiency improvements
   b. On-farm efficiency upgrades
   c. Lower water use cropping
4. Healthy Lands
   a. Soil health and the effective use of water
   b. Natural working land improvements
   c. Reducing erosion and improving water quality

The foundation for any of these possible actions are meeting the requirements of Colorado Water Law and compliance with Interstate Compact agreements.

Statement of Peter Goble, Climatologist
Colorado Climate Center
Colorado State University
Fort Collins, Colorado

Hearing on the High Plains:
Combating Drought with Innovation

U.S. Committee on Agriculture, Nutrition and Forestry
Subcommittee on
Conservation, Climate, Forestry, and Natural Resources

Good morning, everyone. My name is Peter Goble and I am a climatologist with the Colorado Climate Center at Colorado State University in Fort Collins. I am grateful for the opportunity to testify today and consider it an honor and a privilege to participate in this panel. My professional background is in researching climate change and variability, as well as water availability, in Colorado and the western United States.

The Colorado Climate office collects and observes data with the purpose of monitoring the climate, placing individual events into historical perspective, disseminating climate information to the public, and providing climate expertise as part of the decision-making process. The Center is dedicated to the development of tools and methods to better communicate the climatology and climate variability of Colorado to scientists, educators, stakeholders, media, and the general public. To better understand Colorado's climate, and how it is changing, the staff also regularly conducts (and collaborates on) research projects. The ability to participate in numerous climate service activities has also given me the chance to regularly communicate climate issues to the public, including farmers.

Our office recently completed a project funded by the Colorado Water Conservation Board where we synthesized the observed and projected changes to temperature, precipitation, water resources, and natural hazards across the state[1]. I want to thank my colleague Dr. Becky Bolinger for leading this effort, as well as State Climatologist Russ Schumacher and Jeff Lukas of Lukas Climate for their enormous roles writing this report.

A study of Colorado's historical climate record tells us that farming and ranching in Colorado is not for the faint of heart. Our farmers in eastern Colorado and western Kansas rely on an average of only 15-20 inches of precipitation annually, about half of what falls over America's heartland. Furthermore, this precipitation is highly variable from year-to-year. Right here in Burlington, a wet year like 2015 can bring over 25 inches of precipitation, whereas a dry year, like 2002 brings less than 9 inches. A bad crop destroys a farmer's profit margins, and a bad year of forage can force a rancher to make difficult decisions about culling the herd. Moreover, our precipitation does not always fall as cold, soaking, million-dollar rains. Sometimes it is from an intense thunderstorm whose bounties run off the field before soaking into the soil, sometimes it is hail that shreds the corn, millet, and triticale. Sometimes it is a spring blizzard threatening livestock during calving season.

[1] climatechange.colostate.edu

Unfortunately, one other lesson our climate data tells us is that our climate is warming; a trend consistent with warming temperatures around the globe, which is driven primarily by human emissions of greenhouse gases. The National Center for Environmental information estimates that Colorado has warmed by an average of 2.9 ˚F over the last 125 years. The warming trend is significant with high statistical confidence and has accelerated since the 1980's. Precipitation has not significantly increased or decreased in the long term in Colorado. Even so, there is widespread evidence that our warmer temperatures are lowering annual mountain snowpack here in Colorado and across the western United States. Over the last seventy years our peak season snowpack in Colorado has declined by 5-10% in our northern river basins, and 10-20% in our southern river basins. These declines are troubling because streamflow from snowmelt is important to farmers across our state for irrigation. Warmer temperatures also impact our summer water balance. Hotter weather raises evaporation rates from bare soil and transpiration rates through crop root systems. Under this added stress, crops can either lose their soil moisture more quickly to the atmosphere, or simply shut down in the blistering heat. Hotter summers lead to more frequent and severe droughts, which decrease crop yields, and impact the bottom line for our honest, hard-working farmers.

The wet years are not without challenges either. Our climate models indicate that even though precipitation may not decline in the future, a higher fraction of it will fall in extreme events, including, but not limited to, large hail. While trends in extreme events are less clear than they are for temperature, 2023 set records for severe weather reports in Colorado. We saw more storms with one, two, three, and four-inch diameter hail than any other year. We even saw our first hailstone of over 5 inches in diameter. I have brought a 3-D printed mold of the previous record hailstone, which fell in 2019, just five years ago. The stone from last year melted too much to make a similar mold before being preserved, but keep in mind it was larger than this stone.

In most challenges there are opportunities, and as a soon-to-be father I can't help but see the value in a message of hope. The impacts of climate change can be combated through mitigation and adaptation. From a mitigation standpoint, renewable energy has become much more cost-competitive over the past decade. We are emitting carbon at rates well below what was projected in what climate scientists called "business as usual" scenarios 15 years ago. We still have lots of work to do, but we have already come a long way.

Humans are also highly adaptable creatures. By continuing to study, update, and adhere to the best crop and land management practices we can continue to thrive in the face of intensifying natural hazards.

Finally, as a scientist, I cannot pass up this opportunity to stress the importance of continued data collection. Long-term, consistent climate observations are the backbone of our understanding of climate globally and right here at home. It is vital that we continue to invest in networks like the National Weather Service's Cooperative Observer Network, state mesonets — like the one Chip runs in Kansas, and the one we run in Colorado — and even community science efforts, such as the Community Collaborative Rain, Hail, and Snow Network, that allow people from all walks of life to contribute to our understanding of weather and climate. Together we can learn and adapt to ensure our food system is resilient to an ever-changing environment.

Thank you.

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Connie Owen, Director

Laura Kelly, Governor

Written Testimony
Constance C. Owen, Director
Kansas Water Office
Submitted to the
Senate Agriculture Committee
Subcommittee on Conservation, Climate, Forestry and Natural Resources
June 26, 2024

Chairman Bennet and Ranking Member Marshall, thank you for the opportunity to appear today to discuss "The High Plains: Combating Drought with Innovation." My name is Constance C. Owen. I serve as the Director of the Kansas Water Office (KWO) located in Topeka, Kansas. Our office is the state level policy, planning and coordination agency for all water issues in Kansas. The KWO also serves as a public water supply utility through contracts with the U.S. Army Corps of Engineers for water storage space in federal reservoirs in Kansas. A flagship responsibility of the KWO is the development of the Kansas Water Plan, which focuses on the water challenges in Kansas and recommends actions to address those challenges.

The Kansas Water Plan focuses on five guiding principles: Conserve and Extend the High Plains Aquifer; Secure, Protect, and Restore our Kansas Reservoirs; Improve the State's Water Quality; Increase Awareness of Kansas Water Resources; and Reduce Our Vulnerability to Extreme Events. The latter principle addresses resilience to drought, floods, and climate change. Preventing and mitigating the adverse impacts of drought in Kansas are of utmost importance to all water uses, whether agricultural, municipal, industrial, recreational or environmental. In recent years, the increasing severity of drought in Kansas magnifies the urgency of the need to address this threat.

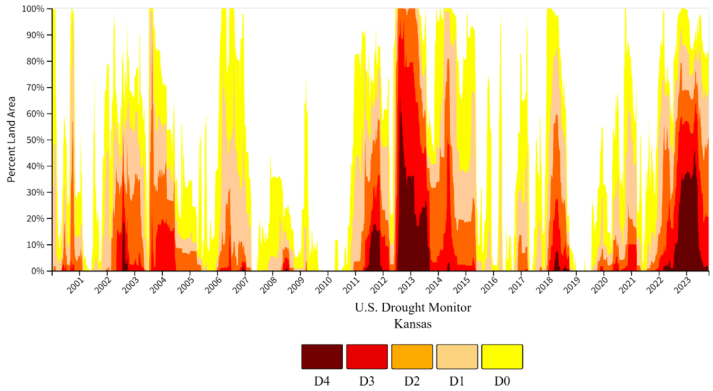
As reported in the Kansas Water Authority's 2024 Annual Report to the Governor and Legislature:

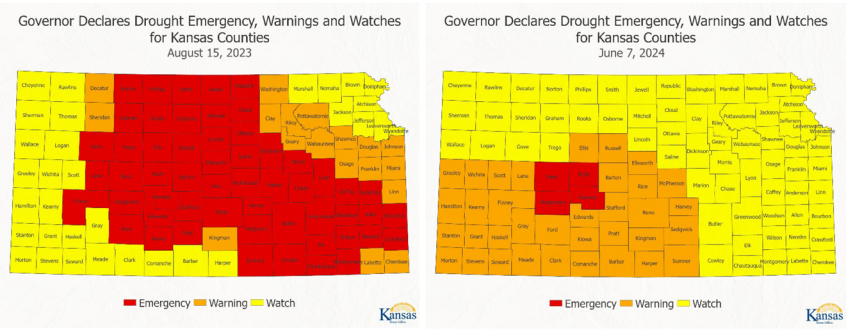
"The Kansas Water Office is responsible for monitoring drought and notifying the Governor when drought conditions exist within the state and recommending assembly of the

Governor's Drought Response Team. The team reviews conditions and recommends drought stages for each county. The Director of the Kansas Water Office makes a recommendation to the Governor, who then issues a drought declaration through executive order. This declaration is in effect until rescinded or superseded. Response to drought is provided through many state programs and associated authorities or responsibilities. The Drought Response Team is responsible for implementing an interagency state government response to drought that is properly coordinated with local and federal response activities at all drought stages. For example, an interagency agreement between the Kansas Water Office, Kansas Department of Wildlife and Parks, and the Kansas Division of Emergency Management qualifies counties in emergency status for emergency use of water from certain state fishing lakes to fight wildfires. These counties also become eligible for water in some federal reservoirs, in addition to state fishing lakes, for domestic stock water."[1]

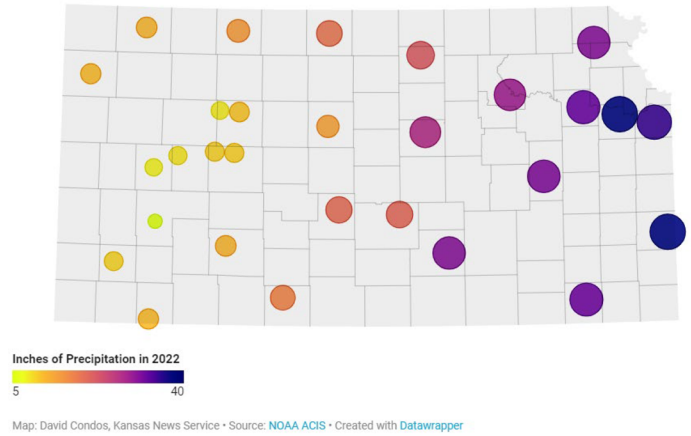
The latest drought declaration from Governor Laura Kelly was issued on June 7, 2024, through executive proclamation. The drought declaration placed four counties into emergency status, 35 counties in warning status, and 66 counties in watch status. Although this declaration is not nearly as dire as in some recent years, the forecast for the coming summer predicts warmer and drier conditions.

Quite recently, Kansas suffered through the 33rd driest period on record since 1895. During the months of October 2022 through September 2023, precipitation was an average of 3.56 inches below normal. The drought declaration issued in response to those conditions placed 55 counties into emergency status, 18 counties in warning status, and 32 counties in watch status.





The economic impacts of severe drought can be devastating, as was seen in the 2022 drought. Many agricultural areas in Kansas, dependent on precipitation and a dwindling groundwater aquifer, saw records broken for the least amount of rainfall since record-keeping began. Finney County saw only 5.03 inches all year, the lowest amount since 1893; Scott County saw only 8.01 inches, the lowest since 1895; and Lane County saw 8.75 inches, the lowest since 1901. Other record lows were recorded in Trego and Ness Counties, as well.[2]

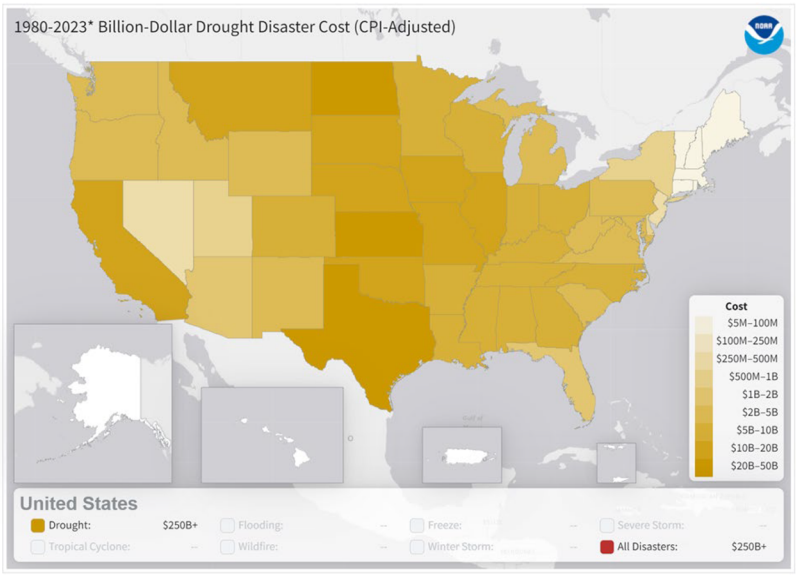


In Kansas, the economic driver for most of the state is agriculture, including crops and livestock. Without adequate water, the domino effect of drought can cripple a local, regional and statewide economy. With large scale crop failures due to drought, the lost income stream is felt down the supply chain, from seed sellers to equipment repair shops, to grocery stores and local retailers. Predictably, the impact can lead to higher food prices and food scarcity. Ultimately, severe and extended drought conditions can threaten national security interests.

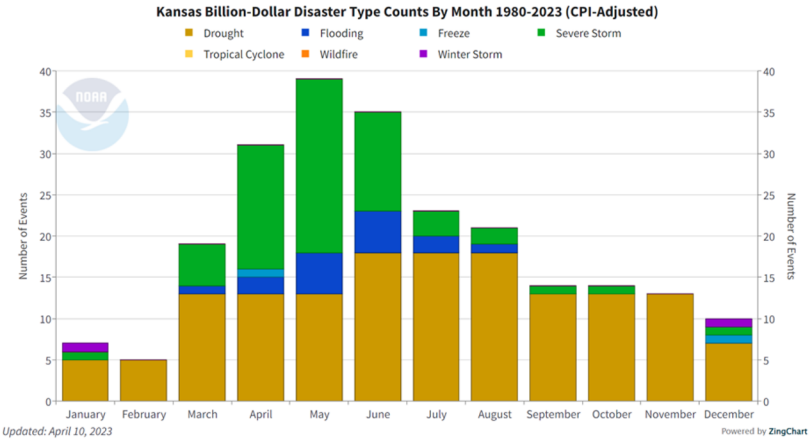
As reported in the Kansas Water Plan, Kansas is facing a warming trend in the future accompanied by a potential increase in the frequency, duration, and intensity of extreme events. This is evidenced by temperatures in Kansas rising about 1.5°F since the beginning of the 20th century with temperature increases more pronounced in the winter and spring. Even small increases in average temperatures result in increased evaporation and evapotranspiration, as well as raise the risk of heat waves, wildfires and droughts. Additionally, higher surface water evaporation and more turbulent atmospheric conditions can lead to severe weather.[3]

Extreme high temperatures and higher than normal wind conditions contributed to the agricultural devastation. “Across western Kansas — in towns from WaKeeney to Dodge City to Oakley — the number of 100-degree days in 2022 landed in the top 10 of all years on record.”[4] Some areas experienced wind conditions breaking records dating back to the 1940s.[5] In the

summer of 2022, the intense heat and lack of precipitation was responsible for the deaths of thousands of cattle in several Kansas counties, including Seward, Haskell, Grant, Finney, Gray and Scott.[6] Kansas sits behind only Texas and North Dakota in the number of Billion-Dollar drought disasters dating back to 1980.[7]



Our most common disaster type in Kansas is drought, with roughly 65% of Kansas billion-dollar disaster events dating back to 1980 being drought-related.[8]

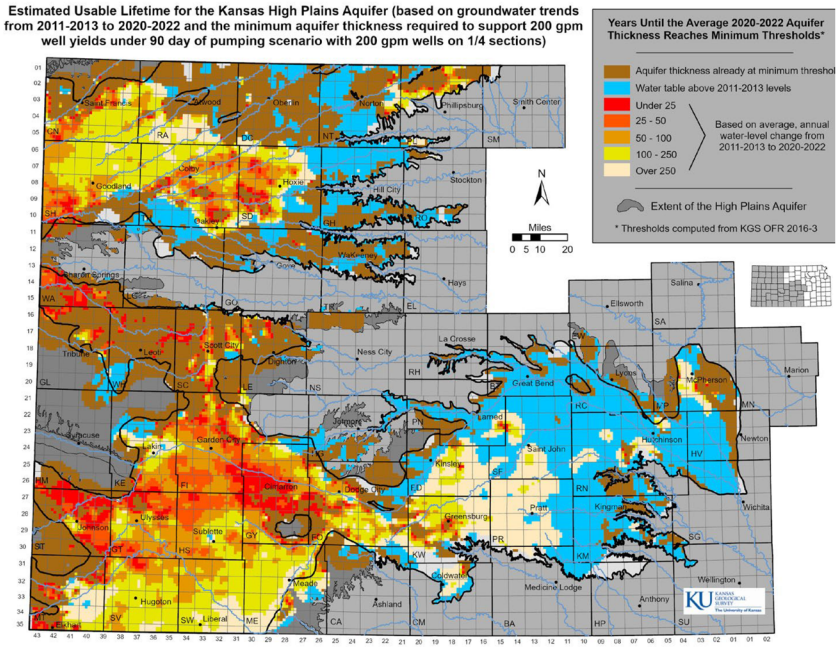


Kansas suffered another extreme drought from late 2010 to late 2015.[9] That multi-year drought peaked in 2012, the warmest and one of the driest years on record, averaging 4.9 inches of rain in May through July.[10] Each year, drought costs the United States an average of $8 billion to $9 billion, as estimated by the USGS.[11] In recent years, drought-related losses in Kansas have been particularly significant in agriculture. In 2017, Kansas ranked 2nd in the country for total crop acres. The total value of agricultural products sold in 2017 was $18.8 billion according to the USDA's National Agricultural Statistics Service.[12]

In 2011, the Kansas Department of Agriculture (KDA) estimated that drought caused roughly $1.8 billion in crop losses in Kansas including the price farmers would have received for lost production and nearly $366 million in drought-related herd liquidation to overfilled cattle livestock auction houses.[13] Even more destructive, the 2012 drought caused more than $3 billion in drought-related crop losses in Kansas. Additionally, more than $1.3 billion in crop insurance indemnity payments for failed commodities were paid to Kansans in 2012 according to the U.S. Department of Agriculture's Risk Management Agency.[14]

In western Kansas, droughts worsen the dire situation of the Ogallala Aquifer's depletion. The Ogallala Aquifer, part of the multi-state High Plains Aquifer, provides nearly all of the water used in western Kansas. Groundwater levels have appreciably declined over the Ogallala region

of the aquifer since the onset of substantial irrigation development (1940s to 1950s in most areas).[15] The water levels have dropped so much in certain areas of the Ogallala region that less than 40% of the original saturated thickness is left.[16] Projections in some areas show no more than 20 years of water remaining if pumping continues at current rates. Other areas in west central Kansas have already reached the point of no return where many acres of once-irrigated land have now been converted to dryland crops or pastures for cattle grazing. Preventing continued (and complete) depletion of the Ogallala Aquifer requires sufficient reduction in withdrawals, a challenge made more difficult to meet when precipitation levels drop.



This Kansas Geological Survey map uses the measured water level change from 2011 to 2022 to estimate how many years into the future until present day aquifer levels reach a point where continuous (>/= 200 gallons per minute) well yields will be unachievable.

While temperature increases in the state are projected to increase drought, the frequency and severity of wildfires are also projected to increase. Warmer temperatures combined with dry vegetation and soil raises the potential for wildfires.[17] In December of 2021, the warmest December to date in Kansas, devastating wildfires swept central Kansas, burning over 165,000 acres of land.[18]

According to the National Drought Mitigation Center, droughts also result in negative environmental and social impacts, as indicated below.[19]

Environmental impacts include:

- Destruction of fish and wildlife habitat
- Lack of food and drinking water for wild animals
- Increase in disease in wild animals, because of reduced food and water supplies
- Migration of wildlife
- Increased stress on endangered species or even extinction
- Lower water levels in reservoirs, lakes, and ponds
- Loss of wetlands
- More wildfires
- Wind and water erosion of soils
- Poor soil quality

Social impacts can include:

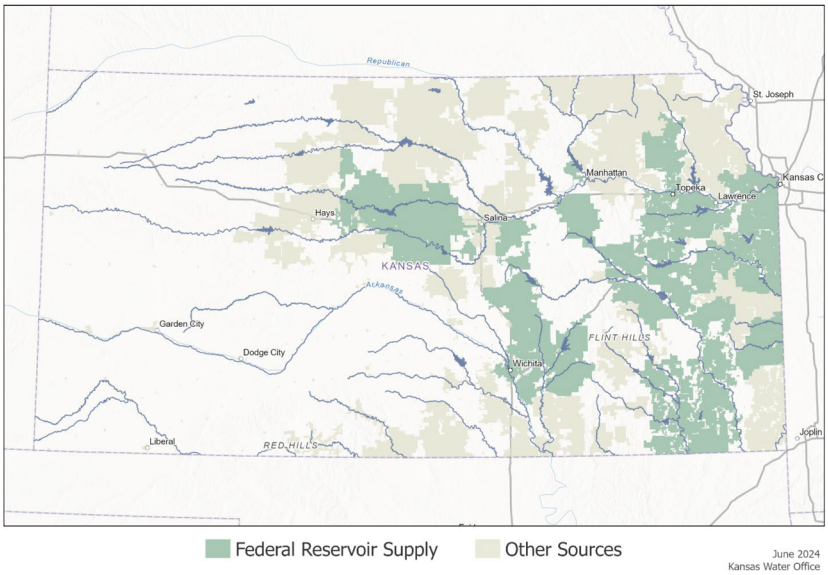
- Anxiety or depression about economic losses caused by drought
- Health problems related to low water flows and poor water quality
- Health problems related to dust
- Loss of human life
- Threat to public safety from an increased number of forest and range fires
- Reduced incomes

- People may have to move from farms into cities, or from one city to another
- Fewer recreational activities

Coping with drought also presents a challenge for public water suppliers. The Kansas Water Office is responsible for the management of state-controlled conservation storage in 15 federal reservoirs to maintain adequate streamflow and water supplies for Kansans, critical to satisfying municipal and industrial demands. Two thirds of the state's population is reliant on stored water in federal reservoirs during drought, and all 15 reservoirs are used to support these needs.[20]

More specifically, 245 water systems or cities in Kansas rely, at least in part, on interconnections with federal reservoirs in Kansas (see map on page 10). Within this group, the largest population centers include WaterOne (Johnson County), Wichita, Topeka, Manhattan, Salina, Emporia, Coffeyville and Independence. Many of these communities and public water supply recipients in Kansas survive drought only because of support from federal reservoir releases. Reservoir support of streamflow was quite dramatic in 2023, with reservoir releases making up more than 90% of the flow in some river reaches.[21]

Public Water Suppliers with Federal Reservoir Drought Support



The critical role of reservoir storage in times of drought amplifies the need to develop ways to manage the increased sedimentation of the reservoirs. Over the life of a reservoir, incoming water brings sediment, which settles into the reservoir. This sediment builds up over time, shrinking the storage capacity for water in the reservoir. New techniques are needed to address this problem, as conventional dredging, as was done at John Redmond Reservoir in 2016, is cost-prohibitive and temporary. The Kansas Water Office is partnering with the U.S. Army Corps of Engineers to conduct a water injection dredging pilot project at Tuttle Creek Lake as a method for addressing sediment build-up. Tuttle Creek Lake presents the most urgent need, as it is the workhorse reservoir for the Kansas River basin (affecting Manhattan, Topeka. Lawrence and Johnson County) and its storage capacity has shrunk by nearly 50%.[22]

In short, when reservoirs lose storage capacity due to sedimentation, they lose the ability to store water for when it is vitally needed during drought. Because 245 water suppliers and

communities in Kansas rely on releases from reservoirs in times of drought, reduced storage of water increases the risks posed to those communities.

Drought also affects communities and water users who rely on other sources of water. The small town of Caney (population less than 2000) does not rely on water released from federal reservoirs; instead, it relies primarily on the flow of the Little Caney River. In 2023, Caney faced a crisis as the area suffered a severe drought and that river virtually ran dry.[23] The town employed major restrictions, including the use of bottled water only in restaurants, portable toilets at the public schools, fewer school days and closure of the swimming pool and car wash in an effort to endure the shortage.[24] Although the situation improved by the beginning of 2024, the long-term supply remains in doubt, and the city is planning infrastructure improvements to connect to a more reliable system nearby.[25]

In an effort to assist communities to plan for drought and employ conservation practices, the Kansas Water Office develops and maintains guidelines for developing water conservation plans and practices.[26] These plans include information on state drought declarations, stages, triggers, goals and responsive actions for public water suppliers. For responding to drought, the Conservation Plan Guidelines identify three stages of implementation: water watch (in which suppliers need to stay alert for changing conditions), water warning (in which some curtailment of use is recommended for decreasing supplies), and water emergency (in which mandatory restrictions are in place because severe water shortages could result in system failure without improvement).[27]

In summary, droughts in Kansas have been increasing in frequency and intensity. Every sector, including agriculture, municipalities, industry, recreation and the environment, is experiencing, and will continue to experience, negative impacts of drought. The fact that the state's water supplies are shrinking, from depletion of the Ogallala Aquifer to sedimentation of federal reservoirs, only accelerates this crisis. Adaptation and planning for resilience will be critical.

[1] 2024 Annual Report, pg. 34, kwo.ks.gov
[2] David Condos. How bad was the 2022 drought? For these 7 Kansas communities, it was the driest on record.
[3] 2022 Kansas Water Plan, pg. 61, kwo.ks.gov
[4] David Condos. How bad was the 2022 drought? For these 7 Kansas communities, it was the driest on record
[5] David Condos. How bad was the 2022 drought? For these 7 Kansas communities, it was the driest on record
[6] David Condos. The heat killed so many Kansas cattle in June that the only place to take carcasses was a landfill.
[7] NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2023). https://www.ncei.noaa.gov/access/billions/
[8] NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2023). https://www.ncei.noaa.gov/access/billions/
[9] 2022 Kansas Water Plan, pg. 65, kwo.ks.gov
[10] Frankson, R., K.E. Kunkel, L.E. Stevens, D.R. Easterling, X. Lin, M. Shulski, N.A. Umphlett, and C.J. Stiles. 2022. Kansas State Climate Summary 2022. NOAA Technical Report NESDIS 150-KS. NOAA/NESDIS, Silver Spring, MD, 5 pp. https://statesummaries.ncics.org/chapter/ks/
[11] USGS, Kansas Water Science Center, Kansas Drought. https://www.usgs.gov/centers/ kswsc/science/kansas-drought
[12] United States Department of Agriculture, National Agricultural Statistics Service. https://www.nass.usda.gov/index.php
[13] 2022 Kansas Water Plan, pg. 66, kwo.ks.gov
[14] Bickel, Amy. "End of Dry Conditions on Horizon for Some in Kansas." The Topeka Capital Journal, 12 Apr. 2013. https://www.cjonline.com/story/news/2013/04/12/end-dryconditions-horizon-some-kansas/16400636007
[15] 2022 Kansas Water Plan, pg. 18, kwo.ks.gov.
[16] Status of the High Plains Aquifer in Kansas; Donald O. Whittemore, James J. Butler, Jr., and B. Brownie Wilson; KGS Technical Series 22-2018; http://www.kgs.ku.edu/Publications/Bulletins/ TS22/index.html
[17] 2022 Kansas Water Plan, pg. 65, kwo.ks.gov
[18] NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2022). https://www.ncei.noaa.gov/access/billions/
[19] National Drought Mitigation Center. How Does Drought Affect Our Lives?
[20] 2024 Annual Report, Kansas Water Authority, pg. 34.
[21] 2024 Annual Report, Kansas Water Authority, pg. 34.
[22] 2024 Annual Report, Kansas Water Authority, pg.17.
[23] Allison Kite. Southeast Kansas town is almost out of water, and signs of crisis are everywhere.
[24] Allison Kite. Southeast Kansas town is almost out of water, and signs of crisis are everywhere.
[25] Amber Jenkins. Caney finds relief in water shortage, plans for future sustainability.
[26] Kansas Water Office. Climate and Drought in Kansas.
[27] Kansas Water Office. Climate and Drought in Kansas.

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Written Testimony
Christopher Redmond, Meteorologist and Kansas Mesonet Manager
Department of Agronomy, Kansas State University

On behalf of the
Current Drought Assessment and the Kansas Mesonet

Submitted to the
United States Senate Committee
Agriculture, Nutrition, and Forestry; Subcommittee on Conservation, Climate, Forestry, and Natural Resources

For the Burlington, Colorado June 26, 2024 Field Event Titled: "Hearing on the High Plains: Combating Drought with Innovation."

Thank you for this opportunity to share an overview of the Kansas Mesonet and status of drought conditions across the High Plains. Through history, there have been trying times for agriculture in Kansas and this period is no different. We work to provide state producers, agencies and federal partners improved decision support datasets and optimize limited natural resources.

My name is Christopher "Chip" Redmond and I am a Meteorologist in the Department of Agronomy and the Kansas Mesonet manager at Kansas State University. Over the last 11 years in this position, I have helped expand the Mesonet, a network of agricultural and emergency management supporting weather stations (Figure 1), by over 50 additional stations through enhanced collaborations and partnerships. During this time, we have supported the direct return of millions of dollars back to Kansans through high quality and representative weather/climate data. For example, in 2019 alone, we provided supporting weather data to over 1,600 livestock loss claims through the United States Department of Agriculture Farm Service Agency Livestock Indemnity Program (LIP) claims resulting in the payouts of over $7.6 million dollars back to producers (LIP, 2020). This is only a small impact of the broader support the Mesonet provides to our users including producers, private enterprise and governmental agencies.

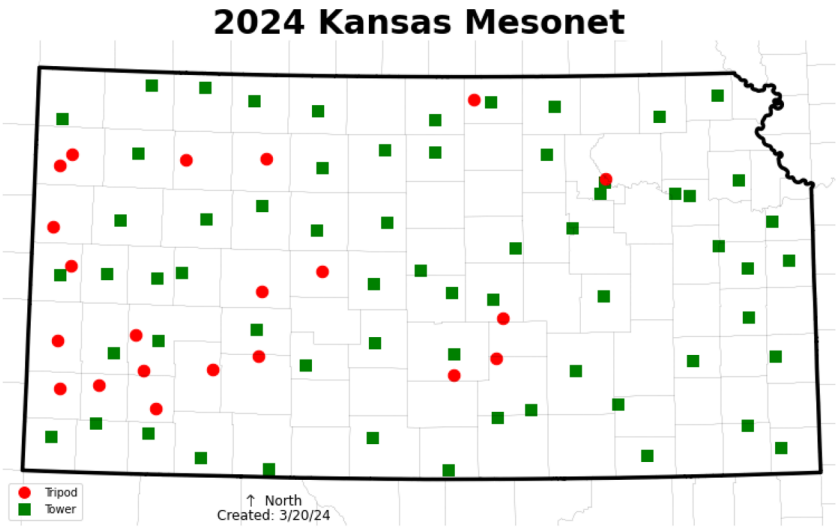

Figure 1. Current location of the Kansas Mesonet weather stations as of June 1, 2024. Source: mesonet.ksu.edu.

The climate of the High Plains can support excellent crops. Unfortunately, they can also bring devastation to agriculture; sometimes an event spanning several minutes can erase months of hard work. Drought and floods are typical for the region. These tend to offset one another over a span of several years with no one year typically reaching “normal.” Of these weather fluctuations that frequent the High Plains, drought is often the most impactful.

Drought has over 150 published definitions (Drought.gov, 2024) and can vary by who you talk to. For instance, the Merriam-Webster Dictionary defined drought as: "A period of dryness especially when prolonged (Merriam-Webster, 2024)." Meanwhile, the American Meteorological Society (AMS) considers drought as a “period of abnormally dry weather sufficiently long enough to cause a serious hydrological imbalance (AMS, 2024).” The National Oceanic and Atmospheric Administration’s (NOAA) National Weather Service (NWS) further elaborates on potential impacts by defining it as “a deficiency of moisture that results in adverse impacts on people, animals, or vegetation over a sizable area (NWS, 2024).” Livelihoods and the sustainability of the High Plains heavily rely on the availability of water. Therefore, we must consider both agricultural and societal impacts the most. The resulting monitoring and tracking of long term precipitation and/or lack thereof, are critical in working to mitigate drought impacts and helping to prepare the next generation for the future changing climate.

Last year, 2023, brought a shift in the long term drought of the High Plains eastward into the Central Plains. This brought much needed moisture for western Kansas and the Colorado plains

and erased widespread United States Drought Monitor (US Drought Monitor, 2024) categories of extreme (D3) to exceptional (D4) drought initially at the start of 2023 (Figure 2, left). These wetter conditions resulted in good performing crops. The April-July 2023 period resulted in top ten wettest on record dating back to 1895 for most counties along and around the Kansas/Colorado state line (NCEI, 2024a). While there were still periods of stress in 2023, especially further east into central Kansas, the beneficial moisture helped sustain last year's growing season across the High Plains. Much of this moisture was the result of a weakening La Nina, colder than normal water in the eastern equatorial Pacific. This led to a transition to neutral (El Niño Southern Oscillation, ENSO) conditions and eventually an introduction of El Nino by the fall characterized by warmer than normal water over the same area of the Pacific (CPC, 2024). The High Plains region had struggled with moisture over the previous three years due to persistent La Nina. Historically, La Nina results in high pressure dominating the area with less precipitation and warmer than normal temperatures overall. The transition to El Nino brought this much needed increased precipitation for portions of the High Plains through December 2023.

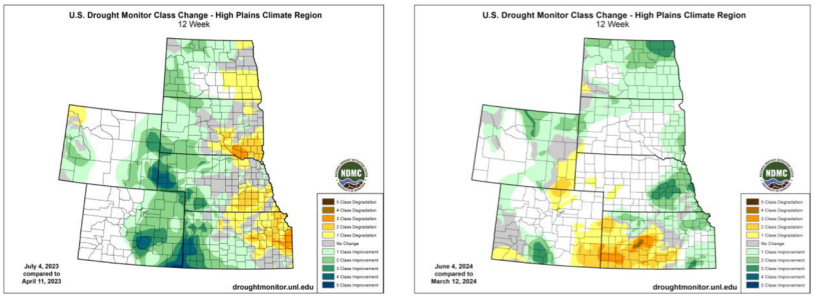

Figure 2. Drought change over the High Plains between April to July 2023 (left) and between March 2024 to June 2024. Drought improvements are in the green/blue whereas degradation is in yellow/orange. Maps as of June 13, 2024 from the US Drought Monitor (2024).

Unfortunately, this surplus of moisture was short lived. As of early June 2024, drought had once again prevailed and the reintroduction of D3 drought (US Drought Monitor 2024) had returned to Kansas with widespread drier conditions (Figure 2, right). While a weakening El Nino is likely a contributor, another factor is likely the waters of the North Pacific. Cool water along the North American/Canadian coast in the East Pacific combined with warmer waters in the middle of the North Pacific resulted in a negative Pacific Decadal Oscillation (-PDO). This -PDO typically persists in ten year segments and is usually very slow to change. The last time it was inverted, or positive (+PDO), was 2019 (NCEI, 2024b) when the majority of the High Plains region had drought free conditions on the Drought Monitor (Figure 3). In the last ten years, the other +PDO

time period was 2015, when a similar minimal drought period existed across the High Plains. Lastly, it is important to note that there are other oscillations and global patterns that impact the weather/climate in this region. However, ENSO and PDO have been the most prevailing influencers in High Plains drought persistence and development.

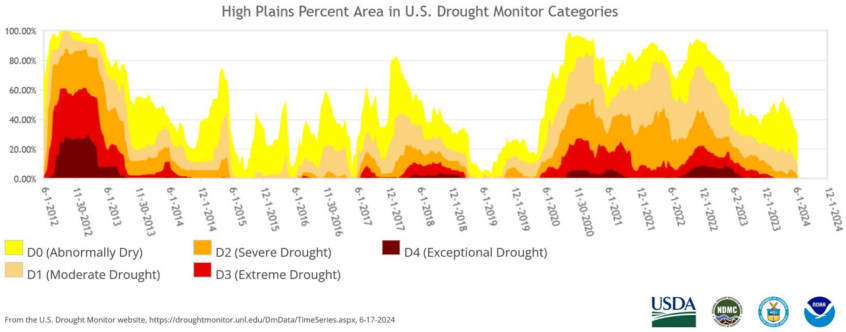

Figure 3. Drought Monitor categories over time (since 2012) for the High Plains region. Source, US Drought Monitor.

As we enter a period of potential summer 2024 drought, we must consider the current trends in climatology of the High Plains. Building off Peter Goble's testimony, the data in Kansas points to similar climate trends. While we continue observing both wet and dry years as expected with regional climatology, another disturbing long term pattern has emerged. Heavy rains have been increasing, however, periods between such rains are longer in duration. For example, ten days or longer streaks between wetting rains (0.1" or more) have increased 25% at the Tribune, Kansas NWS Cooperative Observer (COOP) site. That means not only are there more dry spells but also additional opportunity to miss critically timed moisture during crop growth in the warm season.

When precipitation does fall, there has been a roughly 20% increase in 1" rain events since 1897. Therefore, this heavier rainfall has less opportunity to be absorbed by the surface and is more likely to run off. The region needs lighter rain events to capture the moisture in the ground and store it for crop utilization. When we lose heavy rainfall to runoff, we require more timely rain events to keep up with crop growth during the summer months. This end result is more limited surface moisture and higher demands from natural resources like the Ogallala Aquifer.

Additionally, these heavy rains place stress on flood storage, infrastructure and downstream entities to handle increasing runoff events of which they previously weren't built to support.

Understanding climate and the limited High Plains resources has led to water use reduction efforts across the region (KDA, 2024). While this has resulted in improved water use, data to make these decisions is dependent upon new (in relative terms to climate) data observations that help producers make decisions. This is especially a concern because locations like Tribune's NWS COOP, that has accurately reported since 1897, are becoming more limited. In research done by the Kansas Climate Office, the state has lost 36% of its long term COOP observers since 2000. Therefore, quality climate data has become increasingly sparse. This is where state networks like the Kansas Mesonet (Mesonet, 2024) or Colorado's COlorado AGricultural Meteorological nETwork (CoAgMET, 2024) are increasingly important to long term support of regional agriculture and sustainment of local natural resources. These weather and environmental networks not only sustain historical standardized data collection but also build an enhanced spatial and temporal database. These provide significant additional meteorological and climatological phenomena beyond historical temperature and precipitation data. Therefore, the applicability and usability of both raw data and derived products (such as National Fire Danger Rating System, crop herbicide/pesticide spray guidance, soil temperature and moisture products) are more supportive of producer decisions beyond the original NWS COOP data.

Both the Kansas Mesonet and the CoAgMET networks are part of the National Mesonet Program (NMP). The NMP consists of automated weather station networks located in areas most susceptible to severe weather and data sparse regions and installed closely together to gather "mesoscale meteorological" observations such as temperature, humidity, and atmospheric pressure (NOAA, 2024). Due to their proximity to each other, Mesonet data can identify small-scale features at the surface that can indicate rapidly deteriorating weather conditions not shown by other observations. These are critical to providing data in areas that are underrepresented and increasingly scarce in the absence of NWS COOP data. Additionally, to better monitor and understand drought and the resulting impacts, supporting such networks as the Mesonet, whether through the NWS Weather Reauthorization Act (HR-6093, 2024) or the National Mesonet Authorization Act (HR-2995, 2024) are essential in helping the producers and other entities in the High Plains region.

With the changing landscape of weather observations and building drought concerns amidst a dynamic climate, evaluating drought conditions is critical to producer success in the High Plains. While some improvements have occurred over the last year, drought will continue to challenge producers in 2024 and beyond. Therefore, decision makers will rely heavily on data provided from these Mesonets to assist with irrigation planning, understanding crop stress, soil moisture availability, fire weather risk and ground truthing for resulting loss insurance payouts of both crops and livestock.

On behalf of the Kansas Mesonet and the Kansas State Climate Office, thank you very much for the opportunity to present this information. Many utilize the weather data in the region with over one million Kansas Mesonet website interactions in 2023. As a result, we hope to not only

support the efforts of the High Plains producers but also provide a vital resource for those that need this data on an operational or research basis. Lastly, I'd like to acknowledge Matthew Sittel (Assistant Kansas State Climatologist) for his help in building this report.

Sincerely,

Christopher "Chip" Redmond
Meteorologist at Kansas State University and Kansas Mesonet Manager

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Statement of Alexander Funk, Director of Water Resources and Senior Counsel
Theodore Roosevelt Conservation Partnership
Denver, Colorado

Hearing on the High Plains: Combating Drought with Innovation

Hearing of Subcommittee on Conservation, Climate, Forestry, and Natural Resources
United States Senate

June 26, 2024

Chairman Bennet, Ranking Member Marshall, and members of the subcommittee thank you for the opportunity to speak with you today about these critical issues.

My name is Alexander Funk, and I am the Director of Water Resources and Senior Counsel with the Theodore Roosevelt Conservation Partnership. Established in 2002, the mission of the Theodore Roosevelt Conservation Partnership (TRCP) is to guarantee all Americans a quality place to hunt and fish. The TRCP is a coalition-building organization that unites and amplifies the voices of hunters and anglers around issues that affect fish and wildlife conservation, habitat, and access. At the TRCP, we are dedicated to ensuring the places where Americans love to hunt and fish are conserved and the species upon which we depend as hunters and anglers are managed sustainably.

We work with 63 diverse partner organizations and countless other allies, grassroots supporters, and businesses on the issues most important to hunters and anglers—including management of America's fish and wildlife species, public lands, forests, river systems, wetlands, and saltwater fisheries, as well as policy and funding for private lands conservation, clean water initiatives, drought solutions, and Gulf Coast restoration. The TRCP is a voice for hunters and anglers in Washington, D.C., and nationwide. The TRCP works to craft common-sense policies benefiting fish and wildlife and works in partnership with agencies and landowners to get work done on the ground.

A major component of my work at the TRCP involves working with the conservation and agricultural communities to advance innovative, workable solutions to addressing drought in western states and watersheds. Specifically, we work to raise awareness of the challenges facing western farmers and ranchers from drought and aridification. We highlight examples of how these same producers are working with conservation partners to increase the pace and scale of voluntary efforts to minimize drought risk while benefiting fish and wildlife. These include practices like upgrading irrigation diversion and delivery systems to use limited water supplies more efficiently, promoting innovative agricultural water conservation approaches such as shifting to water-thrifty crops, building soil health, and restoring riparian and wetland habitats to increase aquifer recharge and attenuation of

flows. And we work to develop and advance policies that support these crucial projects in ways that work for the people most impacted by them.

TRCP encourages Congress to move quickly to pass a bipartisan Farm Bill to ensure funding and technical assistance are available to increase the pace and scale of several innovative drought adaptation and mitigation efforts described above. Failure to pass a Farm Bill in this Congress could jeopardize the availability of certain USDA conservation programs in the next Congress, which would be a significant blow to addressing ongoing drought and water supply challenges in Colorado, Kansas, and other western states. These programs are voluntary, incentive based, and effective, and, if available, can go a long way toward addressing the drought challenges farmers and ranchers face across the West.

The Impacts of Drought to Hunting and Fishing and Our Economy

Hunting and fishing play an important economic role nationally and here in Colorado. The National Survey of Fishing, Hunting and Wildlife-Associated Recreation, released recently by the U.S. Fish and Wildlife Service, shows that hunting and fishing contributes $145 billion annually to the United States economy. Hunting and fishing contribute over $3.25 billion to Colorado's economy annually, benefiting all 64 counties and supporting more than 25,000 full time jobs from small businesses to manufacturers to the tourism industry. According to the National Shooting Sports Foundation, hunting is responsible for nearly 8,000 jobs in Kansas, generating $2.9 million in salaries and wages and $60 million in state and local taxes. Through the purchase of annual hunting licenses and permits, hunters generate more than $20 million and qualify Kansas to receive nearly $10 million in funding derived from excise taxes on hunting and shooting equipment.

Drought and climate change threaten the viability of hunting and fishing and, as such, our economy in many ways. For terrestrial wildlife, drought impacts all aspects of habitat quality. For example, according to the Kansas Department of Wildlife & Parks, intense drought conditions in western Kansas throughout 2022 reduced pheasant populations by limiting the growth of nesting cover as well as valuable food resources such as milo and corn.[1] Drought also reduces wetland availability, contributing to declines in waterfowl populations, lower duck production, and less habitat during the critical migration and wintering periods, thus resulting in fewer hunting opportunities. Furthermore, reduced irrigation supplies during the growing season can affect both managed wetlands and agricultural crops (especially rice) and can contribute to declines in waterfowl as these agricultural practices sustain important habitats. According to Colorado Parks and Wildlife, drought, particularly when followed by severe winter conditions, is a driver of long-term declines in mule deer populations, among other causes, including disease and human impacts to habitats such as roads and fences.[2]

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[1] https://ksoutdoors.com/Hunting/Upland-Birds/Upland-Bird-Forecast
[2] https://cpw.state.co.us/Documents/MuleDeer/ColoradosMuleDeerStory.pdf

Of course, drought and climate change also have a direct impact on aquatic ecosystems throughout Colorado, Kansas, and other western states. Drought conditions reduce stream flow, which impacts habitat quality and availability. Reduced flows impact water quality through lower dissolved oxygen concentrations and increased water temperature, which can result in significant stress and mortality to fish and other aquatic species. These flow reductions are happening on a significant scale. For example, United States Geological Survey research from 2020 found that streamflow in the Upper Colorado River Basin is decreasing by about 5 percent per degree Fahrenheit because of atmospheric warming, causing a 20% reduction in flows over the past century.[3] During the last 20 years, the Rio Grande's annual flows in southern Colorado's San Luis Valley have also decreased, placing more pressure on declining groundwater supplies.[4] Across the west, state agencies and local governments are closing rivers to all recreational use, including fishing, due to declining water flows and increased water temperatures. While these closures are necessary management tools to protect fisheries, they impact local economies reliant in part on summer tourism and could occur more frequently absent the development of additional tools to mitigate these reductions in flows.

Western fish and wildlife are well-adapted to drought, and negative impacts, like those described above, are manageable when they occur infrequently and for a short period. But as aridification on the High Plains and the West more broadly continues, these impacts will only become more problematic. Immediate adaptation and mitigation activities are needed to avoid major impacts on fish, wildlife, and our economy.

Increase the Pace and Scale of Innovative Drought Adaptation and Mitigation Efforts

The Kansas Water Plan and Colorado Water Plan recognize that with climate change, fish and wildlife and water users will continue to feel the direct impacts of drought, extreme weather events, and wildfires. These challenges are compounded by projected population growth, contributing to an existing water supply-demand gap. For example, the Colorado Water Plan finds that if no water projects or strategies are implemented, modeling for the driest periods shows Colorado communities could need 230,000-740,000 acre-feet of additional water annually by 2050.[5] To address these challenges, both state water plans recognize the need to dramatically increase the pace and scale of drought and climate change adaptation and mitigation measures as essential for future water security. Fortunately, Colorado and Kansas are pioneering several innovative water management and conservation approaches to address these drought and climate challenges while generating substantial co-benefits for farmers and ranchers, rural communities, and fish and wildlife.

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[3] https://www.usgs.gov/news/colorado-river-flow-dwindles-warming-driven-loss-reflective-snow-energizes-evaporation

[4] https://www.cpr.org/2022/03/08/upper-rio-grande-river-basin-decline-san-luis-valley-water-users-taking-action-state-of-the-basin-symposium/

[5] Id.

Addressing Aging Water Infrastructure

At the request of the Colorado General Assembly, the Colorado River Drought Task Force recently released a report with recommendations to address drought conditions.[6] The Task Force consisted of state and local government representatives, water management agencies, municipal water providers, agricultural interests, conservation organizations, and Tribes. While the report focuses on the Colorado River Basin, the final recommendations apply to all western watersheds. The report found unanimous support for increasing public funding to address water loss associated with aging water infrastructure. Aging infrastructure is extremely costly to replace or upgrade, but doing so provides significant water savings by avoiding losses. This is especially true in agricultural supply systems where lining or piping irrigation canals and laterals can often reduce the need to divert or pump additional water to maintain crop production.

The United States Department of Agriculture and other federal agencies, including the Bureau of Reclamation, have several resources at their disposal to address aging infrastructure. Still, more can be done to enhance water security, benefit agricultural producers, and benefit fish and wildlife. The 2018 Farm Bill included several provisions designed to address western water challenges. The Environmental Quality Incentives Program (EQIP) was modified to allow the Natural Resources Conservation Service (NRCS) to enter contracts with water management entities such as irrigation districts, ditch companies, and groundwater management districts to implement voluntary regional-scale water conservation and efficiency improvements. Despite this authorization, NRCS has not widely utilized this new authority within western states, partly due to limited NRCS guidance on how best to implement these provisions in line with the statute and limited financial and technical resources. The TRCP continues to support the development of additional guidance on implementing these provisions and would be eager to work with USDA leadership to discuss how to support these applications at a much larger scale.

Another emerging opportunity to address aging infrastructure challenges is the NRCS Watershed and Flood Prevention Program (also known as the “PL-566” program). The PL-566 Watershed Program is increasingly being utilized to address several western water challenges, from efforts to modernize water systems to enhance the resilience of aquatic ecosystems. However, as currently structured, the PL-566 Watershed Program struggles to meet increasing demand and to address unique western water challenges. Efforts are underway to modernize the PL-566 Watershed Program to increase the pace and scale of multi-benefit watershed resilience projects in western states, including several provisions of the *Healthy Watersheds, Healthy Communities Act of 2023* (S.2636). That bill introduced by Senator Bennet, Senator Fischer, and Senator Merkley would ensure drought resilience benefits can be realized through projects, simplify planning requirements for nature-based projects, and increase allowable federal contributions to projects.

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[6] https://crdroughttaskforce.com/

Scaling Innovative, Voluntary Water Conservation Approaches

Addressing drought and climate change and their associated impacts on western water supplies will also require additional research and demonstration of innovative, voluntary water conservation approaches that reduce overall demand on surface and groundwater supplies while maintaining agricultural productivity, particularly on prime farmland throughout the west, as these lands are the most critical for maintaining food, feed, and fiber production.

Fortunately, several promising water conservation approaches are taking place in Colorado that could serve as models for broader regional efforts. Beginning in 2020, with funding from state and local agencies, the Colorado Master Irrigator Program launched to serve as a comprehensive education course available to Republican River Basin and San Luis Valley irrigators, two regions where irrigated agriculture depends on declining aquifer resources.[7] Colorado Master Irrigator offers farmers and farm managers advanced training on conservation and efficiency-oriented irrigation management practices and tools. Program graduates are also eligible for equipment discounts and favorable EQIP cost-share rates to implement water conservation and efficiency practices discussed during the course. Since the program's launch the program has provided training and resources to over 60 irrigators and crop professionals in the Republican River Basin of eastern Colorado who collectively manage over 75,000 acres. The program has become so popular that it has expanded to include the San Luis Valley, and programs designed for Colorado's Western Slope and Arkansas River Basin are also in development. Expansion of these peer-learning programs in other states struggling with water resource challenges should be considered.

Another innovative approach is testing alternative forage crops to enhance drought resilience. With financial support from the Colorado Water Conservation Board, American Rivers and the Colorado Ag Water Alliance are leading a multi-state research project that is testing more efficient alternatives to grass and alfalfa hay that account for a large share of water use in the West. A group of partners, which includes public universities and conservation groups, are conducting field trials at research stations and private lands at different elevations in Western Colorado to better understand which forage species and varieties are most productive and profitable under dry conditions and whether they can be grown at scale. Three test crops were chosen for their potential to produce high-quality hay and pasture while supporting soil and water conservation. One of the forages being tested, the Kernza® variety of intermediate wheatgrass, also produces grain, which can be used in beer brewing. Partners are currently focusing on identifying best practices for establishing the three crops. This effort will address whether these three crops are economically feasible in the region if they use comparatively less water and whether they can be grown at the scale needed to address water scarcity challenges.

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[7] https://www.comasterirrigator.org/page/about

The TRCP supports the utilization of innovative approaches to sustainable groundwater management, including conservation easements to address declining surface and groundwater supplies. Pioneered by Colorado Open Lands to address declining groundwater levels in the San Luis Valley of southern Colorado, these easements include legally enforceable water conservation provisions. By incentivizing voluntary pumping reductions through tailored agreements with landowners, such easements offer a creative alternative to traditional water-saving methods such as fallowing. They can help avoid risks associated with mandatory curtailments of water use, which is becoming much more commonplace in groundwater water-stressed regions, including the Ogallala, Central Valley of California, Snake River Plain in Idaho, and throughout the Rio Grande Basin. These agreements compensate landowners for the value of their pumping reductions through cash payments, tax credits, or a combination of both. Beyond their benefits to the long-term agricultural productivity of the region, these approaches also prevent declining water tables that reduce streamflow and result in the loss of riparian vegetation and wildlife habitat. Congress should consider support for efforts to scale the utilization of groundwater conservation easements and other innovative water conservation approaches, including through the *Voluntary Groundwater Conservation Act* (S.2250), introduced by Senator Bennet and Senator Moran, which would establish a new voluntary groundwater conservation easement program within NRCS.

Finally, the Conservation Reserve Program plays a critical role in drought adaptation. By providing incentives to establish and maintain perennial cover, the CRP protects and restores environmentally sensitive agricultural land while providing a producer with consistent rental income on what are often the riskiest acres on their balance sheet. Perennial cover reduces water loss to evaporation, increases infiltration, prevents erosion and sedimentation, sequesters carbon, and builds soil health. This same cover provides essential wildlife habitat and improves surface and groundwater quality. The CRP has the potential to support the transition from water-intensive annual cropping to grazed livestock systems that are far less water-intensive. Still, there are barriers to this as the program is currently structured. Rental rates under CRP should reflect the program's ecological value and be sufficient to encourage enrollment; that is often not the case. Payment limitations under the CRP have not been updated since 1985 and do not reflect current land values.

Limitations or prohibitions on cost-share for management activities, including mid-contract management, also create disincentives for enrollment or lead to less effective management. For example, in most of the U.S., including Colorado and Kansas, producers who enroll in Grassland CRP cannot access programs like EQIP to address resource concerns on those same acres. A highly successful pilot program in Wyoming has shown the value of allowing those programs to work together for ranchers, and migrating wildlife is the focus of the *Habitat Connectivity on Working Lands Act* (S.4193), introduced by U.S. Representative Vasquez and Representative Zinke and Senator Heinrich. Several provisions of the *CRP Improvement Act of 2023* (S. 174), introduced by Senators Thune and Klobuchar, would also enact helpful changes, including increasing the CRP annual

payment limitation and making CRP grazing more viable by providing cost-share for the establishment of grazing infrastructure including fencing and water infrastructure.

Additionally, despite these barriers, the CRP is effectively at its statutory acreage cap, meaning that farmers and ranchers who could benefit from the CRP will not have access to it in the coming years. Removing these and other barriers would greatly enhance the ability of the CRP to support farms and ranches on the High Plains and across the U.S. while increasing resilience to drought at meaningful scales.

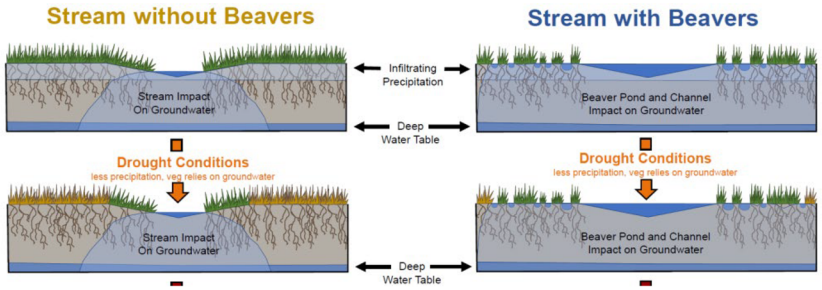
Building Resilience Through Natural Infrastructure Approaches

The TRCP encourages Congress to further recognize the benefits of and increase public investments in scaling natural infrastructure approaches to enhance resilience to drought and other natural disasters such as wildfires. Natural infrastructure projects restore nature's processes to provide key services and ecosystem functions. These projects use existing or restored natural landscapes and features such as forests, floodplains, and wetlands to increase resilience to drought and climate impacts.

Natural infrastructure can strengthen climate resilience by enhancing water security, reducing drought impacts, mitigating floods, and reducing wildfire risk. Investment in natural infrastructure solutions is essential in the face of reductions in streamflow. Snow accounts for two-thirds of the inflow into major storage reservoirs in the Basin, and over the past 60 years, snowpack has declined across 90% of monitoring sites. Proactive forest and wet meadow restoration and management can improve snowpack retention and prolong snowmelt and runoff by helping soils slow runoff so rivers flow longer into the dry season. Additionally, investment in forests, floodplains, agricultural practices, urban green spaces, and urban infrastructure will ensure a climate-resilient future in western watersheds by providing multiple economic, environmental, and social benefits to communities that need functioning infrastructure and a healthy environment.

Specifically, one natural infrastructure approach is gaining recognition to address risks associated with wildfire and drought throughout western states: the utilization of beaver-assisted riverscape restoration efforts. Beavers build dams, dig channels, and change small streams into broad wetland areas. Their ponds and channels, particularly, slow down water and spread it out in the landscape. This gives water more time to soak into the soil, which keeps plants green and lush even during periods of drought. For example, research from Dr. Emily Fairfax, an Associate Professor of Geography at the University of Minnesota, demonstrates that healthy natural stream systems and restored headwater floodplains, including those influenced by beaver activity, enhance natural water storage capacity by more effectively slowing down flashy spring runoff and other flooding events that can be more slowly released to streams during summer months when water is most needed for irrigation and fish and wildlife.[8]

[8] https://repository.library.noaa.gov/view/noaa/48627



Conceptual model created by Dr. Emily Fairfax (2017). CC BY-NC-ND

Beaver-modified riverscapes can enhance drought resilience in arid landscapes. Photo by the Bureau of Land Management.

Beaver-modified riverscapes also help build resistance to wildfire. Photo by Dr. Joe Wheaton, Utah State University.

Overall, scaling these beaver-assisted restoration efforts can provide significant benefits for addressing drought challenges facing both agricultural producers and fish and wildlife. Critical, immediate needs to scale these beaver-assisted restoration efforts include expanding programmatic and capacity-building resources for state and Tribal wildlife management agencies working to support beaver management and restoration efforts and funding for landowner education around the benefits of beaver and funding for non-lethal beaver management efforts that can address concerns around minimizing beaver-related damage to water infrastructure while maximizing their drought resilience benefits.

A Multi-Title Approach to Drought Adaptation and Mitigation Efforts in the Farm Bill

The TRCP encourages Congress and USDA to consider a "multi-title" approach to addressing drought adaptation and mitigation challenges in the West. While the Conservation Title and its associated programs can play a more significant role in addressing drought-related challenges, other sections of the Farm Bill, including the Foresty, Rural Development, and Research titles, can also play a significant role.

Forest and Watershed Management for Drought and Wildfire Security

Forests are home to our natural water infrastructure - the source watershed streams, wetlands, and meadows that capture annual snowmelt and storm events and provide critical drinking water for communities across the West. 65% of the drinking water supply in the Western United States comes from forests. Forests and their natural water

infrastructure also serve as natural reservoirs; enhancing drought resilience through soil moisture storage and groundwater recharge helps sustain river base flows in the summer when crops, livestock, people, and wildlife need water. Well-managed forests and their supporting natural water infrastructure provide numerous additional public benefits, including preventing soil erosion, improving water quality, lowering water treatment costs, capturing carbon, and benefiting wildlife habitat and fisheries.

The Farm Bill provides an opportunity to increase the pace and scale of forest headwater restoration to address drought and other natural disasters. Specifically, strengthening the Water Source Protection Program and Watershed Condition Framework, which provide authority to the U.S. Forest Service to develop and implement watershed restoration activities that build resilience to natural disasters, should be a priority. The *Headwaters Protection Act* (S.1853), introduced by Senator Bennet and Senator Crapo, would make several critical improvements to these programs, including enhancing overall funding, expanding access to include more agricultural water users, reducing the non-federal cost share, providing more flexibility for water users to work with the Forest Service to access these funds, and prioritize investments in natural infrastructure approaches that build resilience to drought and wildfire. Other opportunities include expanding the focus of the Collaborative Forest Landscape Restoration Program and Joint Chiefs Landscape Restoration Partnership Program to give special consideration to proposals that seek to reduce the risk of uncharacteristic wildfire or enhance watershed health and drinking water sources.

Dedicated Financial Resources for Western and Working Lands

A significant challenge to increasing the pace and scale of drought mitigation and adaptation efforts is a lack of dedicated funding. Unlike other geographic regions, such as the Chesapeake Bay and Great Lakes, which have dedicated NRCS funding programs, no targeted funding is available for conservation and restoration efforts in western watersheds. In early 2023, the NRCS released the Western Water and Working Lands Framework for Conservation Action. In the Framework, NRCS identifies water resource challenges and a suite of conservation practices and strategies to address those challenges. While the framework does provide a roadmap for addressing climate change and building drought resilience, it does not come with any dedicated funding.

The TRCP and several conservation and agricultural partners support dedicated funding to implement the Western Water and Working Lands Framework. The existing EQIP WaterSMART Initiative, which provides a process for coordinating financial and technical resources between the Bureau of Reclamation and NRCS, could serve as an existing program for directing additional funding to increase the pace and scale of drought adaptation and mitigation efforts, particularly if additional funds would expand the scope of the EQIP WaterSMART Initiative to include a portfolio of voluntary conservation strategies beyond the current focus of off-farm and on-farm water efficiency enhancement. Expanding this program could also help further support better interagency

coordination in terms of the strategic alignment of federal resources to address drought-related issues in ways that benefit agriculture and the environment.

Addressing Universal Barriers to Accessing Federal Resources

Over the past several years, a significant focus for the TRCP has been addressing universal barriers to accessing federal resources to address drought conditions and benefit fish and wildlife in western waters. Despite the historical availability of federal funding, critical challenges from securing adequate cost-share and lacking local capacity to pursue and administer federal funds are significant barriers facing rural communities and water users in accessing federal resources. The TRCP acknowledges that Congress and USDA have made significant strides in addressing these barriers. Particularly, the TRCP supports ongoing implementation and funding for the Equity in Conservation Outreach Cooperative Agreements Initiative. USDA is investing up to $70 million in cooperative agreements to support outreach to underserved producers and communities about opportunities to participate in NRCS conservation programs. We also support dedicated funding for the Rural Partners Network, which provides resources to rural and underserved communities to access federal resources for critical needs, including water infrastructure. We also support current efforts to evaluate changes to the Regional Conservation Partnership Program and Technical Service Provider program to enhance the delivery of technical assistance to producers and other partner organizations. As such, we thank Senator Bennet and Senator Marshall for addressing the technical assistance shortages, including through the *Increased TSP Access Act* (H.R. 3036), which would streamline the process for TSP certification.

Despite these efforts, we encourage Congress to support efforts in the next Farm Bill that address these universal barriers. For example, the *Rural Partnership and Prosperity Act of 2023* (S. 3309), introduced by Senators Casey and Senator Fischer, would address critical barriers such as a lack of funding and staffing capacity in rural and Tribal communities to navigate the complex system of federal grants. Specifically, the legislation would create a new Rural Prosperity Technical Assistance Grant Program with USDA Rural Development that would provide financial assistance to rural and Tribal communities to increase capacity to assist them in navigating and applying for federal funding opportunities to address local priorities. The TRCP also encourages Congress to support other opportunities in the Farm Bill to expand workforce development and job creation programs in rural areas that could help establish the trained workforce necessary to increase the pace and scale of drought adaptation and mitigation strategies. For example, reauthorizing and expanding the Rural Innovation Stronger Economy Grant Program to include workforce development opportunities for forestry and conservation practices would help address critical workforce bottlenecks in rural and underserved communities such as eastern Colorado and the San Luis Valley and ensure there is an adequate workforce ready to address long-term drought challenges in the western United States.

Conclusion

In closing, thank you again, Chairman Bennet, Ranking Member Marshall, and other members of the Subcommittee, for the opportunity today to speak about the drought and climate change impacts facing western agriculture and watersheds. The TRCP appreciates the efforts of Congress to work through difficult negotiations around the future of food and farming in the United States. Drought and climate change continue to impact western agriculture's long-term viability, food and water security, economies, and iconic fish and wildlife habitat. As such, we encourage Congress to move swiftly in passing a bipartisan Farm Bill that recognizes the unique challenges facing western watersheds, includes additional resources necessary to increase the pace and scale of drought adaption and mitigation efforts through both structural and natural infrastructure approaches, and enhances the long-term viability and resilience of rural and underserved communities in the face of drought. Failure to pass a Farm Bill in this Congress could jeopardize the availability of certain USDA conservation programs in the next Congress, which would be a significant blow to addressing ongoing drought and water supply challenges in Colorado, Kansas, and other western states. The TRCP and our partners in the hunting and fishing community are ready to work with you to craft a Farm Bill beneficial for agriculture, fish, and wildlife.

COLORADO
Department of Agriculture

Statement of Kate Greenberg, Commissioner
Colorado Department of Agriculture
Broomfield, Colorado

Hearing on the High Plains:
Combating Drought with Innovation

Hearing of Subcommittee on
Conservation, Climate, Forestry, and Natural Resources
United States Senate

Chairman Bennet and Ranking Member Marshall, thank you for the opportunity to speak with you today about the impacts drought is having in Colorado and how our farmers and ranchers are responding to this challenge.

My name is Kate Greenberg and I serve as Colorado's Commissioner of Agriculture. The mission of the Colorado Department of Agriculture is to strengthen and advance agriculture in our state; promote a safe and high-quality food supply; protect consumers; and foster responsible stewardship of the environment and natural resources. Our vision is that Colorado agriculture continues to be strong and vibrant, a key driver of the state's economy, and recognized worldwide for its safe and abundant supply of high-quality food and agriculture products.

The Department serves as a partner with our agricultural producers in meeting current and future challenges to food and fiber production. In my time as Commissioner, our focus has been on implementing producer-led, voluntary, and incentive-based approaches to meeting shared challenges. Our work has included the creation of the Agricultural Drought and Climate Resilience Office (ADCRO) to identify and focus resources to mitigate the impacts of drought and a warming climate. The ADCRO now houses our renewable energy programs, technical assistance for USDA Rural Energy for America Program (REAP) grants, our Soil Health Program, and our climate policy and planning efforts.

Direct benefit of conservation and climate resilience resources to agricultural communities

CDA was able to leverage state stimulus funding that was a response to the impacts of the COVID-19 pandemic to invest $3,000,000 in 130 drought and climate resilience projects throughout Colorado, an additional $3,000,000 in 27 on farm and ranch renewable energy and energy efficiency projects, and $2,000,000 to support the enrollment of 125 producers and

24,473 acres in Colorado's STAR Soil Health program.[1] Much of the additional investments made by the state of Colorado were leveraged with federal funding.

Since 2015, the Department's renewable energy and energy efficiency (ACRE3) program has produced three technical guides, 59 feasibility studies, and awarded funding to 140 on-farm energy projects in 27 Colorado counties. These projects represent $11.3 million in total estimated project value, including $4.8 million in state-funded awards, $1.9 million in USDA EQIP funding, and $150,000 from other grant sources.

In 2022 and 2023, the ACRE3 program provided direct technical assistance and $2.6 million in funding for 31 infrastructure projects representing $5.5 million in project value. Combined, these projects are delivering 3,900 tons per year in CO2e emissions reductions, $231,000 in annual energy cost savings for Colorado producers, and the equivalent of 9.7 million kilowatt-hours in annual energy savings. These projects modernize outmoded infrastructure and increase profit margins through reductions in operating costs for dairies and other operations, improving their economic resilience.

Starting in 2023, the Department has been investing an additional $500,000 per year to advance the use of agrivoltaics in Colorado. Projects funded through this initiative include: test converting a conventional solar array into an agrivoltaics system that supports grazing and growing crops underneath solar panels, installing new bifacial vertical panels on an existing demonstration site and testing an agrivoltaic "shelterbelt" on the edge-of-farm to measure soil, water, and energy production benefits.[2]

The Colorado Soil Health Program supports farmers and ranchers in improving their soil quality. CDA partners with conservation districts and local eligible entities to provide financial and technical assistance to producers. Farmers can enroll at any stage of their soil health journey and receive support to experiment with healthy soil practices on a portion of their operation.

From 2021-2024, CDA enrolled more than 500 farmers and ranchers in the Colorado Soil Health Program, leading to new soil health practices on over 65,500 acres.

The Colorado Soil Health program is focused on the five principles of soil health: Soil armor; Minimizing soil disturbance; Plant diversity; Continuous live plant/root; and Livestock integration. The program encourages producers to evaluate the specific context of their operation and field, decide what resources or practices they want to focus on, and then

[1] CDA Stimulus Report 2020-2022
https://docs.google.com/presentation/d/1HR3od75qixpfLZlR3l-b1o4FEecYtVx297MVwHkppSs/edit#slide=id.g1ce42661044_0_142

[2] Governor Polis Announces Funding for Agrivoltaics Grants to Help Colorado's Agriculture Industry Benefit from Solar Technology
https://ag.colorado.gov/press-release/governor-polis-announces-funding-for-agrivoltaics-grants-to-help-colorados

provides up to $5000/year matching funds to implement the producer's chosen practices. Participants gain familiarity and expertise with new practices and an increased understanding of the environmental and economic outcomes associated with them.

The Colorado Soil Health Program (CSHP) also provides equipment grants, peer-to-peer learning opportunities, field day support, and funds CSU Extension and CSU Ag Experiment Station staff to provide additional technical support. Participants also do a STAR Field Evaluation, receive two soil tests, and a soil moisture monitoring system for their enrolled field.

The CSHP has been made possible through financial support from Colorado state stimulus funds, NRCS Conservation Innovation Grant, USDA Climate Smart Commodities (CSC) Grant, Colorado Water Conservation Board (CWCB), Colorado Department of Public Health and the Environment (CDPHE), the Wallace Foundation and National Fish and Wildlife Foundation. Further, the CSC Grant provided $25M to not only expand the CSHP, but also to build the STAR framework into a functional national non-profit and help 6 other western states adapt it to further their own soil health priorities and programs. One of the key components of the CSC Grant is to build market rewards to build better profitability into better land stewardship. The flexibility offered by the CSC grant compared to other USDA funding sources was vital to bringing the partnerships together.

Collaboration at the producer, local, state, tribal, and federal levels has been key to the success of our drought and climate resilience programs. This continued partnership, especially with funding support from the USDA, is vital to continuing the innovative responses our producers are implementing to continue agricultural production in the face of mounting drought and climate challenges.

Advancing state and federal partnerships for rural and agricultural opportunity

Federal programs need to be flexible to allow for innovation at the state, local, and producer levels. One way of doing this is by partnering with states to support the programs that they are implementing. Colorado's Soil Health and renewable energy programs are examples of how federal funding can leverage the existing partnerships of state and local organizations to achieve significant outcomes. Leveraging the financial strength of the federal government with local knowledge and support is an approach that benefits everyone.

Federal programs that support Colorado's drought and climate resilience efforts could be better funded and tailored to meet the needs of the West, or at a minimum, allow greater flexibility to meet the varied needs of every part of our country.

Specifically, Colorado has been a leader in utilizing conservation easements to protect agricultural lands. Increasing funding for the Agricultural Conservation Easement Program and allowing the program to cover project costs for landowners would allow for greater use of this

tool. The Environmental Quality Incentive Program is a vital partner in our renewable energy efforts, with additional funding as well as increasing in the program's federal matching contribution percentage, we could complete additional projects.

With increased funding and the complexities of applying for and expending grant funding, an increased focus on providing technical assistance is needed. Landowners need more technical assistance, whether delivered by USDA or partner employees provided through contribution agreements with state agencies.

The Regional Conservation Partnership Program (RCPP) is at a point now where changes need to be made to ensure its continued success. It's a cumbersome program that requires extensive administrative oversight. The lack of administrative funding in RCPP creates a significant hurdle for conservation partners wanting to address regional conservation issues. The extensive oversight required, combined with the lack of administrative funding, has resulted in a program that is no longer an option for funding some regional conservation projects.

Successes we have had implementing the CSHP with a CSC grant provide an example of what can be accomplished without the restrictions that RCPP has. Additionally the administrative funding and technical assistance that was available through the CSC grant is what has made the state and local partnerships possible. To accomplish what we have through the CSC grant required funding at the state and local level to administer the program, provide technical assistance, and direct producer payments.

The 2018 Farm Bill provided that dryland agricultural uses may be permitted under the Conservation Reserve Enhancement Program (CREP) with the adoption of best management practices on enrolled land. While there have been challenges with implementing this provision, the ability to allow dryland crop production on enrolled lands is key to Colorado enrolling the necessary acres in CREP to meet interstate compact requirements. This is another example of the type of flexibility that is needed in USDA programs so they are successful at meeting both federal objectives and local needs.

Disaster relief programs need to be fully funded to address the losses that producers face due to the increasing frequency and severity of natural disasters, including drought, resulting from a changing climate. The increase in severity and frequency of these events is predictable, yet relief programs remain focused on maintaining the status quo in terms of agricultural production and practices. In order to both encourage building drought and climate resilience and maintain the long-term financial stability of disaster relief programs, there needs to be a change in focus from incentivizing a return to pre-disaster practices to incentivizing practices that will be more resilient in the future, resulting in less disruption to agricultural production and a lesser need for disaster assistance.

Finally, we need to continue to make investments in research, incentive programs for voluntary practices, and technical assistance that equip more farmers and ranchers with additional options to protect and conserve natural resources through on-farm practices that reduce greenhouse gas emissions, increase carbon sequestration and adjust to a changing climate. Colorado State University and our other land grant universities are critical partners in researching and developing practices that will be necessary to continue agricultural production in an increasingly arid climate. This is an investment that must be made at the federal level to ensure continued food and economic security for the country.

I appreciate the opportunity to discuss how Colorado is working to meet the drought and climate challenges facing our agricultural producers and how federal programs can be better tailored to work cooperatively with states in achieving shared goals. My team and I are available to provide additional information and assist you in this work. Thank you for your time and consideration.

Written Statement of Don Brown, Director
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Hearing on the High Plains:
Combating Drought with Innovation

Hearing of Subcommittee on Conservation,
Climate, Forestry, and Natural Resources

United State Senate
June 26, 2024

Chairman Bennet, Ranking Member Marshall, members of the subcommittee, and staff. Thank you for the opportunity to speak with you today concerning the issues surrounding the efforts minimizing the impact of drought on producing food and fiber on the high plains of Colorado and Kansas.

When reviewing the list of panelists who have been charged with addressing USDA drought programs. I believe my role is to represent the producers who live on the High Plains that have utilized and benefitted from the various programs provided through the Farm Service Agency (FSA) and the Natural Resource Conservation Service (NRCS).

It seems appropriate to share a bit of my background and my families' background in order to provide you with some insight as to how the viewpoints I will express here today were formed. These viewpoints are based on my accumulated experiences and the shared experiences of family members who came before me. My great grandfather Andrew Brown homesteaded near Woodston, KS, in 1874. A couple of hours drive straight east of here and my grandfather Albert Brown homesteaded near Yuma, CO. A town located approximately 80 miles northwest of Burlington, CO. Both homesteads are located on the true High Plains.

I am a third generation Yuma County Colorado farmer and rancher and I have lived on the High Plains my entire life. Our family still owns and operates the 1911 homestead of Albert and Thelma Brown. In order to remain economically viable my spouse and I have expanded the original 320-acre allotment to thousands of acres and we have been joined by our children on the farm and ranch. The irrigated portion of our operation, which relies on the Ogallala Aquifer, focuses on crops such as corn, wheat, pinto beans and rye for a cover crop. The farm and ranch also includes dryland crops such as wheat, corn, grain sorghum, and native grass pastures which provide summer grazing for several thousand head of cattle. My parents were very early adopters of Coloradan Frank Zybach's circular sprinkler technology and they had one of the very first circular sprinklers in Yuma County.

My remarks today will focus on the fact "the more things change, the more they stay the

same". This proverb appears very appropriate when one views the early recorded history of the High Plains Region and the topic of today's field hearing.

As the arid high plains were settled by homesteaders in the late 1800s and early 1900s the push westward from central Kansas into Colorado was forged by surges forward and retreat. Promotional brochures during the 1880s assured the settlers the plow would bring rain and early on the prophecy appeared to be true. Across large portions of the high plains the drought resistant native sod was plowed in order to plant dry land corn and wheat but then the higher-than-normal precipitation rates returned to normal or below normal and the region plunged into drought conditions, with crops failing the settlers were driven back east where rainfall was more abundant. Many farmers who remained succeeded only because they were located in the Platte and Arkansas River Valleys where they could irrigate their crops.[1]

Kit Carson County, for example, lost 36 percent of its population between 1890 and 1900, while the population of Kiowa County dropped from 1,243 to 701 inhabitants.[2] Kit Carson County is the home of Burlington, Colorado the very town this hearing is being held in. You will note in the aforementioned paragraphs two fundamental and undeniable facts were presented. Dry land farming is completely dependent on rainfall and those farmers and communities who have some form of irrigation fare much better in times of drought.

Even in the 1880s it was quite apparent that some form of supplemental water supply for the crops was extremely important in order for a producer to survive long enough for the rainfall to return.

Then innovation and good luck crossed paths on the High Plains. The turbine pump was refined, the circular sprinkler was invented and much of the High Plains happened to be perched over the Ogallala Aquifer. Various states took varying approaches to permitting and allowing producers to access the aquifer but for today's discussion I will focus on what Colorado recognizes as the Northern High Plains Basin located primarily in the Republican River Basin which drains into Kansas and Nebraska.

Colorado Portion of the Republican River Basin:

The residents of the Republican River Basin (RRB) in Colorado, Kansas and Nebraska suffered from a devastating flood in 1935. In order to acquire federal funds to provide flood control in the basin the federal government required a three-state agreement spelling out the amount of acre feet of water each had to provide to the downriver states. The Republican River Compact (RRC) was negotiated, approved, signed by Colorado, Kansas and Nebraska on December 31, 1942, and approved by Congress, thereby making it federal law. Utilizing federal money seven flood-control reservoirs were built by the Army Corp of Engineers as a result of the RRC including Bonny Reservoir in Colorado.

After the advent of the circular sprinkler a dramatic expansion of irrigated acreage occurred in the RRB leading to altered flows into Harlan County Lake which is located near the Nebraska

[1] http://coloradoencyclopedia.org/article/colorados-great-plains
[2] http://coloradoencyclopedia.org/article/colorados-great-plains

and Kansas borders. Kansas felt as though they had no choice but to remedy the flow issue by pursuing legal action through the courts. Initially this action involved only Nebraska but subsequently in 1998 Nebraska brought Colorado, as the headwaters state, into the fray.

This legal action was filed in the United States Supreme Court and the court appointed Special Master Vincent L. McKusick to preside over the matter. The States negotiated and finally agreed to their obligations per a Final Settlement Stipulation. The States agreed that all claims against each other relating to the RRC occurring before December 15, 2002 would be waived, and dismissed with prejudice. Judge McKusick filed his decision, which stated that per a complex groundwater model agreed upon by the three states the individual states would be required to annually provide a minimum number of acre feet of water for each state's portion of the basin including sub basins. The Final Settlement Stipulation was signed on December 15, 2002.

Compact compliance immediately became a front and center issue for those located in Colorado's portion of the RRB and a multiple prong approach was taken in order to meet the requirements of the Final Settlement Stipulation. First the Republican River Water Conservation District was created by the Colorado General Assembly in 2004 to assure local involvement in the State's efforts to comply with the Republican River Compact between the three states. Early on the RRWCD recognized that in order to fund the measures necessary to achieve compliance the district would have to charge the basin users a fee. In the last twenty years the users have provided approximately one hundred and twenty million dollars of their own money via fees in an effort to comply with the compact.

In 2016 the three states met as the Republican River Compact Administration (RRCA) and agreed to allow Colorado 100% credit for Compact Compliance Pipeline (CCP) which pipes water directly from the Ogallala Aquifer located in the sand hills north of Wray, Co and releases it into the Republican River at the Nebraska state line. The RRCA also agreed that since the CCP did not provide any wet water from the South Fork sub-basin to Kansas, Kansas would require Colorado to remove 25,000 acres from irrigation in the South Fork sub-basin by December 31, 2027. Due to delayed passage of the farm bill the RRCA extended the deadline to December 31, 2029.

The Tools of Compliance:


Compact Compliance Pipeline

Numerous projects have been undertaken including building a sixty-million-dollar Compact Compliance Pipeline which pumps water directly from the Ogallala Aquifer located in the sand hills north of Wray, Co and dumps it into the Republican River at the Nebraska state line. Other tools include purchasing groundwater rights and surface water rights from individuals as well as leasing surface water rights from the Yuma County Water Authority. The surface water is allowed to flow unimpeded down the river assisting in compliance.

However, probably the surest method of achieving compliance according to the structure of the complex groundwater model is the retirement of irrigated acres in the Colorado portion of the basin. In order to assist producers in withstanding the negative financial impact of retiring their irrigated acres the RRWCD has incorporated several programs, a smorgasbord of choices if you will, utilizing RRWCD dollars as well as USDA dollars. Typically these programs consist of a blend of RRWCD and USDA funds.

Early on the RRWCD pursued a Conservation Reserve Enhancement Program (CREP) agreement with the USDA-FSA. Once approved, the CREP program was very successful in retiring close to 30,000 acres of groundwater and surface irrigated land. This CREP agreement provides for complete relinquishment of the irrigation well permit or surface water right and planting the surface to native grass for a period of fifteen years.


Conservation Reserve Enhancement Program - Native Grass

A couple years later, the RRWCD was also successful in forming an agreement with the USDA-NRCS in offering the Environmental Quality Incentives Program (EQIP). This program was also beneficial to the RRWCD, but unreliable and inadequate funding has made this program difficult to utilize on a scale that maximizes its potential. Secondly, the EQIP requires a far larger amount of cost-share from the RRWCD and the RRWCD has had to spend millions of user's fees to supplement the per acre rate offered by NRCS to enhance participation by well owners in the District.

FSA CP100 – Dryland Farmable CREP Provisions

For the past several years I have been actively involved in asking USDA to create a Dryland Farmable Conservation Reserve Enhancement Program (DFCREP) in order to provide additional encouragement for farmers to retire acres from irrigation. In fact as the Colorado Commissioner of Agriculture[3] I collaborated with the Kansas Secretary of Agriculture in drafting language for the 2018 Farm Bill[4] which allows dryland farming on qualifying CREP acres. Thanks to Senator Bennet of Colorado's leadership in championing these provisions the 2018 Farm bill left the ultimate decision for implementation in the hands of the Secretary. Secretary Vilsack recognized the value of a DFCREP and FSA created CP100 under the auspices of the Colorado RRCREP. The intent of CP100 is to allow farmers who own productive high quality soils to permanently retire the irrigation wells but continue to dryland farm the properties as they had been prior to irrigation. Farmers who have younger family members wanting to return to production agriculture need farmable acres and the fifteen year non-farmable retirement period eliminates

[3] Colorado Commissioner of Agriculture – 2015/2019 - Governor John Hickenlooper

[4] Public Law 115-334-12/20/2018-132Stat. 4534 Sec. 2022. Conservation Reserve Enhancement Program

a generation of young people. Per the requirements of the conventional CREP provisions within the rules and regulations of CP100 highly erodible soils must be planted to native grass. On May 8, 2023 the USDA formally announced that producers could enroll eligible land in "CP100, Annual Crop Production, Non-Irrigated." [5] As to this date June 26, 2024, over one year later, the local Colorado FSA offices have received zero applications. In the spring of 2023 during CP100 negotiations with FSA staff we pointed out the barriers we believed existed in their rules and regulations. These very concerns were expressed as early as May 6, 2022 by Mike Sullivan, Deputy State Engineer, Deputy Director of the Colorado Division of Water Resources, in a comment period email[6] to FSA.

Complete lack of interest by the producers has confirmed our suspicions and in order to remove some of these barriers it is quite apparent the introduction of S. 1224 in the 118th Congress – 1st Session on April 20, 2023 – Titled "Conservation Reserve Enhancement Program Improvement Act of 2023" by Senator Bennet and for Senators Marshall, Moran and Hickenlooper is necessary. In particular, S.1224 will remedy the compensation hurdles which exist in the current CP100. CP100 is an essential component of RRWCD's compliance toolbox in particular as it pertains to the South Fork sub-basin deadline of December 31, 2029. Here we are one year closer to the deadline with no prospective participants for CP100 whose requirements are viewed as being too rigorous.

When discussing the requirements of CP 100 with producers it quickly becomes clear not only do they harbor concerns about the lack of appropriate financial compensation but they struggle with the stiff programmatic requirements.

- They feel requiring a non-income producing cover crop in the first year rather than proceeding with dryland operations is unreasonable. Their experience tells them the residue provided by the prior year's irrigated crop normally would provide ample amounts of soil protecting residue and any residual moisture from the prior year's irrigation would assist in growing an income producing crop.
- According to the CP100 Conservation Planning Requirements "Participants may be permitted, as determined by NRCS, to apply up to ½ acre foot of water the first year of the CRP-1 to ensure establishment of acres enrolled in CP 33."[7] Producers feel as though this is an expensive and wasteful means of attempting to establish a cover crop for native grass seeding on 6.5 acres in a 130 acre circle, effectively wasting almost 95.5% of the 65 acre-feet of the water applied when in fact they believe the objective of the CP100 is to conserve the Ogallala Aquifer.

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[5] https://www.fsa.usda.gov/news-room/news-releases/2023/usda-colorado-introduce-additional-conservation-practice-to-address-regional-drought-concerns

[6] May 6,, 2022 email from Mike Sullivan Deputy State Engineer, CDWR to SM.FSA.CREP@usda.gov

[7] Agriculture Resource Conservation Program 2-CRP (Revision 6) 5-08-23 2-CRP (Rev. 6) CO Amend. 9 CO Page 276.5

- Producers view it as an additional financial disincentive requiring non-income producing cover crops in a rigid forced rotation in as many as 30% of the 14-15 contract years. Many feel using proven cropping practices to meet the objectives of reducing soil erosion and improving soil health by allowing the producer to determine when a cover crop should be incorporated would be more appropriate.
- Updating the Conservation Reserve Payment limitation which was established in 1985 at fifty thousand dollars is necessary as some producers located in the South Fork Sub Basin are willing to offer several hundred additional irrigated acres but they reach the payment cap at 125 to 130 CREP acres due to this forty year old non-inflationary adjusted requirement. The cap was initially designed for dryland acres which have a significantly lower per acre rental value when compared to the per acre rental value of irrigated acres.

Conservation Reserve Program

Intermittent drought has been a fixture of the High Plains since written recorded history and thanks to innovation and modern farming methods, coupled with technology; the region remains a viable source of food and fiber for our nation and the world. It seems to me that USDA's role is to smooth out the bumps when the region is experiencing one of its recurring dry periods. Secondly, USDA has and can continue to assist producers removing highly erodible soils from production with programs such as the Conservation Reserve Program (CRP).
It is a little known fact the original CRP occurred during the mid-1950s when farm commodity surpluses were increasing and net farm income was declining. Congress and the administration agreed on a voluntary land retirement through acreage rental payments to farmers. The Soil Bank (Title I of the Agricultural Act of 1956) had two components, the Acreage Reserve Program (ARP) which was designed for the immediate reduction of crop production and the CRP which sought an enduring reduction in cropland acreage. The 1950s version of CRP fulfilled its conservation objectives through retiring erodible land--particularly where erodibility coincided with low yielding cropland.

The reintroduction of the CRP occurred in 1985 under very similar circumstances as the 1950s. The 1985 version of CRP provided for adequate rental payments and was designed to enroll highly erodible land. As 40 years have gone by any measure it has morphed into a wildlife program where quite often grass species which were approved in the inception of the program are required to be destroyed and replaced with what is perceived to be a more desirable species for wildlife. In the arid High Plains region this approach is inherently quite risky because if one happens to attempt to reestablish the NRCS desired grass cover during a drought cycle failure of the new seeding is assured. Leading to eroding soil, intense weed pressure, and wasted cost share funds which would have served better to have been spent elsewhere. On a particular 320 acre parcel that we enrolled in 1989, every ten years we have been required to replace the original approved grasses with very limited success. The USDA Conservation Reserve Program must recognize the tenuous nature of establishing grass cover in the semi-arid High Plains and should accept a well established grass of any species that met their original specifications.

Unlike the original CRP rental rates which were primarily based on erodibility indexes, current CRP rental rates are largely based on soil productivity. This financial compensation structure leads to enrollment of the more productive soils and provides little or no incentive for those who

have poorer soils to enroll. In particular instances in Prowers County, Colorado the rental rates have declined from nearly fifty dollars per acre in the 1990s to as low as thirteen dollars per acre for certain soil types in 2022. This situation should be remedied by shifting one's philosophy back to the original 1950's purpose of retiring erodible land, particularly where erodibility coincides with low yielding cropland.

Additional Comments

When participating in NRCS's EQIP and Conservation Stewardship Program the agency is allowed to conduct the cultural resources portion of the environmental evaluation. This regulation which is located in Section 106 at 36 CFR 800 is an extensive process which involves the following four steps: 1) initiating consultation, 2) identifying historic properties, 3) assessing adverse effects, and 4) resolving adverse effects. However, FSA staff have not attended the training sessions which allow them to earn the certificate granting the authority to conduct the cultural resources evaluation. This evaluation is a critical part of a producer being accepted into various FSA programs and when applying to participate in certain FSA programs the producer is required to hire an individual who possesses the proper certificate. This is a difficult process at best, particularly in isolated rural areas, and a process which the applicant is completely unfamiliar with. It seems it would be much simpler for the FSA to contract with NRCS to conduct the cultural evaluations thereby greatly expediting the process and removing the financial burden from the producer.
No two years are ever alike on the High Plains and I would encourage the subcommittee to continue to focus on drought related research, in particular as it relates to developing increased drought tolerance in existing and new crops. This is an expensive endeavor which large crop protection companies have little interest in as the total volume of production on the High Plains, in their eyes, may not warrant the vast amount of expenditures and the long term time commitment it requires.

The families who are risk takers tend to remain constant throughout generations on the same farm. Our family has always been early adopters and when things go well on enough acres, the work of early adopters typically sparks a revolution of positive change in the agricultural community. We have experienced for decades that those who wait for others to blaze the trail quite often become eligible to collect NRCS and FSA financial incentives, but the farmer taking all the initial risk is left holding the bag. The traditional agency restriction of no retroactive payments disproportionately impacts the same farmers repeatedly and certainly discourages one from taking the financial risk necessary to try any new Climate-Smart practices of significant scale. I would encourage the subcommittee to review this policy and to develop a means of compensating the early adopters.

Conclusion

During the last fifty years I have worked with many different aspects of the USDA and I have found their people, whether they are located at the local, state or federal level, to be helpful and genuinely caring. By no means should any of my comments or viewpoints be construed as my having a negative view of the USDA or its employees. An agency that has nearly one hundred thousand employees and more than four thousand five hundred agencies scattered all across the United States has an enormous task. USDA does a great job considering the scope of their responsibilities.

In closing I believe it is quite appropriate for the United States Senate Committee on Agriculture, Nutrition and Forestry's Subcommittee on Conservation, Climate, Forestry and Natural Resources to encourage USDA to stay the course when it comes to the High Plains.

Innovation is paramount but programs which are tried and true should not be abandoned or edited in such a fashion that they become unrecognizable. One should not discard the original purpose of the Conservation Reserve Program, forget that providing adequate water to livestock through pipelines and watering facilities is essential or fail to recognize the need for supporting wise use of the Ogallala Aquifer as it applies to irrigation water. We must not forget the High Plains region is of value to the nation and its food supply, that rural communities are an important part of our nation's very fabric and most importantly of all acknowledging that if our region is going to survive our youth must have a reason to stay here.

1880 to 2024

"The more things change the more they remain the same"

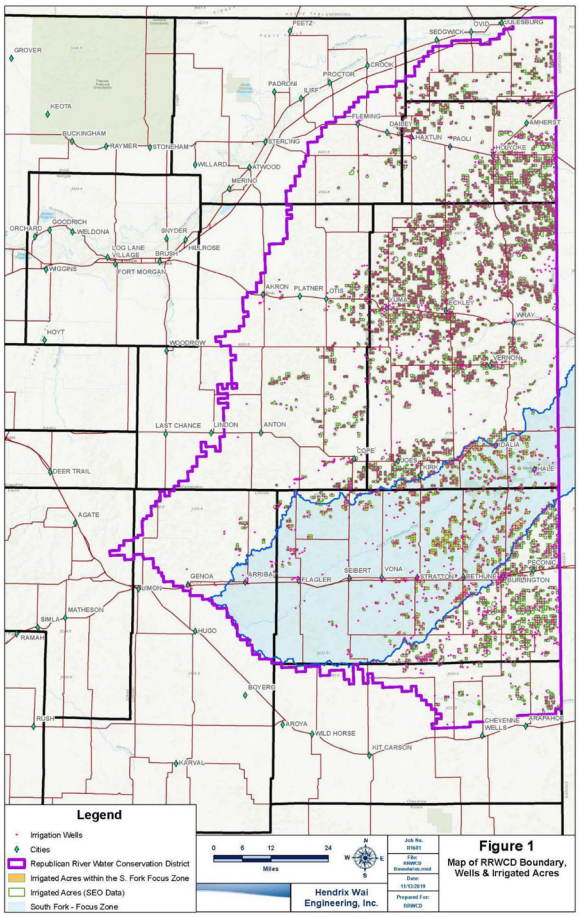
The problem is still a lack of rainfall

Thelma V. Brown Diary
Yuma County, Colorado
Thursday July 17, 1924

"Cool today – Is raining in the PM"

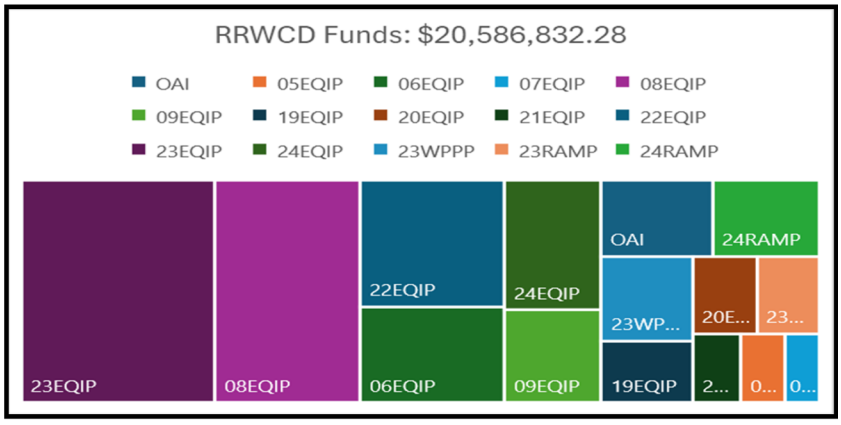
Appendix

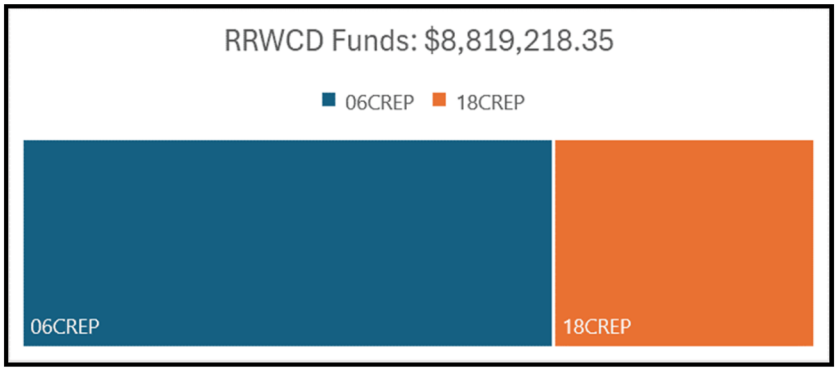
Map of the Republican River Basin in Colorado



Funds from RRWCD Water Use Fees:

Supporting Irrigated Land Retirement





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Mike Beam, Secretary

Laura Kelly, Governor

Written Testimony
Earl D. Lewis, Jr. PE, Chief Engineer
Kansas Department of Agriculture, Division of Water Resources

Submitted to the
Senate Agriculture Committee
Subcommittee on Conservation, Climate, Forestry and Natural Resources
June 26, 2024

Chairman Bennet and Ranking Member Marshall, thank you for the opportunity to appear today at this Hearing on the High Plains: Combating Drought with Innovation. My name is Earl Lewis and I serve as the Chief Engineer of the Kansas Department of Agriculture's Division of Water Resources. In this role, I and my staff deal with water issues across the state of Kansas as well as with our neighboring states. Our primary responsibility is the allocation, management, and regulation of water which becomes even more important and challenging during times of drought.

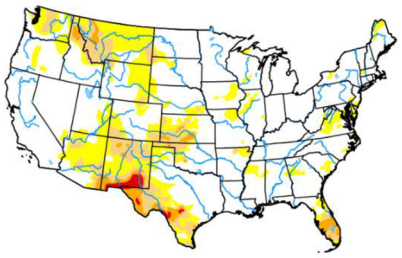
The federal government plays a vital role in addressing drought across the High Plains, particularly the U.S. Department of Agriculture. Those roles range from data collection to drought response. I appreciate the opportunity to provide input on these roles to the subcommittee.

National Integrated Drought Information System (NIDIS) and Drought Monitor

NIDIS is a multi-agency partnership that coordinates drought monitoring, forecasting, planning, and information at national, state, and local levels across the country. The U.S. Drought Monitor (USDM) is a multi-agency product updated each Thursday to show the location and intensity of drought across the country. A recent USDM is shown on the following page. Drought categories show experts' assessments of conditions related to dryness and drought including observations of how much water is available in streams, lakes, and soils compared to usual for the same time of year.

The federal government's role in monitoring drought and brining consistency in the evaluation across the entire country is critical to better preparation and response. I would encourage the committee to support efforts that ensure that USDA participation and input into the development of the USDM be clear and well supported.

Agencies at all levels of government use the USDM to inform decisions about the severity of, and necessary response to, ongoing drought throughout the High Plains region. While drought by its nature is a slow-moving event, the situation on the ground can degrade quickly. As such it is necessary to have the most up to date information when developing the monitor. I would encourage efforts to allow for the submission of additional credible information to be submitted to NIDIS so that the full extent of drought can be properly reflected. The map at right shows the June 13, 2024, USDM. We have heard from local constituents, particularly in Western Kansas that the USDM underestimates the severity of situation on the ground. This can delay access to some emergency response programs described below.



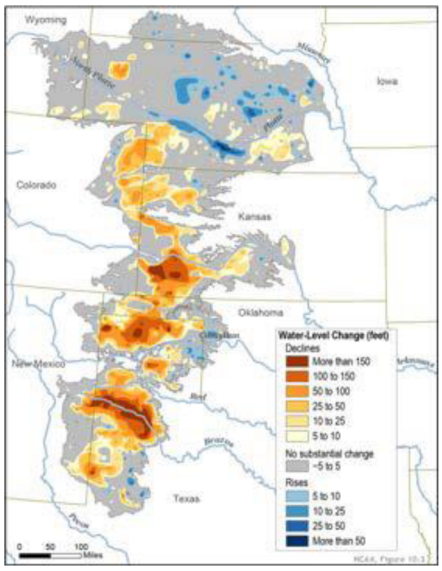
USDA, Agricultural Research Services

In the Great Plains, the Ogallala Aquifer underlies about 112 million acres, or 175,000 square miles, in parts of eight states, including: Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas and Wyoming. It is the principal water source for agriculture, public water supply, industry, and the environment. USDA indicates that 30 percent of all groundwater pumped in the United States is pumped from the Ogallala Aquifer. The Aquifer serves as an extensive underground reservoir providing water to grow cash crops making up the difference between crop needs and precipitation.

The reduction in precipitation during drought results in producers pumping more water for irrigation to ensure a reliable food and fiber supply. The correlation is clear that as we have more and longer droughts, the amount of water pumped from the Ogallala Aquifer increases as do the related water level declines. The Ogallala is not an inexhaustible supply as many of the early users believed that it would be. The USGS map on the following page shows the levels of decline across the aquifer from predevelopment (roughly the 1940s) through 2015. There are many localized areas where the aquifer is effectively dewatered to the point that it is no longer useful for agriculture.

The Ogallala Aquifer supports a significant amount of the nation's food and fiber production. As such conserving and extending the life of the aquifer is of critical importance to both individual states, such as Kansas and Colorado, and the nation as a whole. For several years, U.S. Department of Agriculture's Agricultural Research Services, led by the Bushland, Texas facility, has been active with research universities in the Ogallala states to coordinate and fund research. The collaborative research

covers areas of monitoring, crop research, water management, and others. I would encourage the subcommittee and Congress to provide adequate resources to expand the ongoing research into other areas and topics.



As more areas lose access to significant water across the High Plains Region, producers will need to adapt and move to alternative crops to continue the economic activity that has been vital to the area. Additional research is needed to better understand how to make that happen, as well as outreach to share the information with producers. Additionally, development of additional markets or incentives to grow crops that use less water and are more drought tolerant are needed.

Emergency Haying and Grazing to CRP

Much of High Plains Region economic activity is driven by livestock and animal agriculture. During times of drought, access to feed and forage become even more important, and often difficult to find. Our producers are grateful for the opportunity to access existing Conservation Reserve Program acres for haying or grazing. This can provide a critical stopgap for livestock producers to maintain herds and continue to feed cattle.

One comment we often hear is the time and effort that it takes to release acres for haying and grazing during drought. At times, much of the nutritional value can be lost while the process to make it available is underway. I would encourage the subcommittee to evaluate efforts that would streamline the process to make additional resources available more quickly and ease the requirements for local counties and individual producers.

USDA, Risk Management Agency, Federal Crop Insurance Corporation

Crop insurance is one of the most important and widely supported programs within the U.S. Department of Agriculture. Administered through the Federal Crop Insurance Corporation it has a stated

mission that "promotes the economic stability of agriculture through a sound system of crop insurance and providing the means for the research and experience helpful in devising and establishing such insurance." The development and use of crop insurance has limited the volatility of the agricultural economy and over the years has undoubtedly saved many farms from bankruptcy due to drought and other natural hazards. Like other programs, there are improvements that can be made.

As farmers see a declining water resource and wish to take positive action to reduce their use, crop insurance can be seen as an impediment to that effort. Approximately 10 years ago, the state of Kansas worked with Kansas State University and the University of Nebraska to research the potential for limited irrigation crop insurance. This group worked successfully with the Risk Management Agency covering this region in Kansas City to develop a limited irrigation insurance alternative. While the option has been established, more work needs to be done. Currently, a producer needs to enter into an additional agreement to access this option. In addition, corn is the primary crop for which the limited option exists. Building the limited irrigation option into the existing system without additional agreements and for a broader range of crops would help producers be more aggressive in conserving our water resources.

There also appears to be a lack of clarity about the need to continue irrigation of a covered crop at a time when drought has effectively terminated the growth. Producers are often told that they need to continue to irrigate the crop until an adjuster can visit the site in person and confirm that the crop is no longer viable. Whether this is a policy issue or an education issue is unclear. Additional educational resources need to be made available to both the insurers and the producers on how to deal with this situation. Putting water on a crop that has already died is clearly not in anyone's best interest.

USDA, Rural Development

Drought not only affects farmers and ranchers but industries and local communities. There are resources available both from the Bureau of Reclamation and USDA Rural Development. The communities that are most at risk for emergency related to drought are also the smallest. As with many of the other items both preparation and response are important and can be improved.

In Kansas, we encourage any public water supply system to have multiple sources as well as interconnections to other systems. USDA Rural Development has been supportive of this to the extent that they are allowed. Often those costs are beyond what is considered reasonable for either the grant or loan portion of the programs. Changes to expand eligible costs would be a positive investment versus responding to catastrophe later.

Responding to local water supply emergencies is a multi agency effort lead in Kansas by our Department of Emergency Management. USDA Rural Development has funds that may be used for construction or repair of transmission lines or development of new wells or other sources of supply As our water supply in the high plains becomes more challenged, the options become more limited and the costs become greater. This often comes at a time when local ability to fund solutions is lessened. I would encourage the subcommittee and program administrators to broaden the eligible activities and the funding cap so that better solutions can be implemented.

Summary

Addressing the impact of droughts across the high plains takes commitment at all levels of government as well as individual citizens. The U.S. Department of Agriculture is a key partner in that effort and has provided valuable resources and leadership for decades. Building on that history and continuing to improve the research, programs, and outreach will help to ensure viable communities and economy across the region.

Thank you for the opportunity to testify on this important topic.

Written Testimony

Patrick M. Janssen, Board Chairman

Water Protection Association of Central Kansas

Submitted to the

Senate Committee on Agriculture, Nutrition and Forestry

Subcommittee on Conservation, Climate, Forestry, and Natural Resources

June 26, 2024

Chairman Bennett, and Ranking Member Marshall, thank you for the opportunity to appear today at this Hearing on the High Plains: Combatting Drought with Innovation. My name is Pat Janssen and I serve as the Board Chairman of the Water Protection Association of Central Kansas (Water PACK). As an organization Water PACK is committed to finding solutions to water issues in the counties we represent. At present Water PACK has 750 members with a vested interest in irrigated agriculture operating in Kiowa, Edwards, Pawnee, Barton, Pratt, and Stafford Counties in south Central Kansas. The primary roles Water PACK serves are research, education, political communication, and conservation. We have many partners ranging from the Nature Conservancy of Kansas to the Kansas Water Office.

The federal government plays a large role in ensuring the food security of our nation, as well as keeping the agricultural economies of our rural communities viable for future generations. It is with this, and the future of irrigated agriculture in mind that I submit my testimony today.

Conservation Reserve Enhancement Program (CREP)

The CREP program has had great success in retiring water rights in areas that were experiencing significant declines. It has protected the aquifers in those areas, helped to stabilize water levels, and prevent water quality from degrading. Now that those areas of concern have been addressed the program is trying to retire water rights in areas that are still viable for irrigated crop production. My experience has been in the area of recent CREP expansion into the Rattlesnake Creek Basin in Stafford county Kansas.

There are several challenges preventing adoption of the CREP program in the Rattlesnake basin, and other areas that still have abundant water supplies:

1. The first is economic. The value of an acre of irrigated farm land in Stafford county Kansas is $7000/acre. The value of a comparable non irrigated acre is $2400/acre. This makes the net value of 18 inches of irrigation water $4600/acre. At present the CREP price for this water is $2250/acre or about 51% of the value that water represents in actual land value.
2. The second is program flexibility.
    a. At present Kansas does not have the option to continue non irrigated crop production on property that has been enrolled in CREP.
    b. There is also no option that would allow the retirement of a partial water right through CREP.

   c. The program is very rigid on what type of cover is acceptable for the establishment of grasses in the program, specifically established stands of alfalfa must be destroyed to plant an "acceptable" cover. In the sandy soils of central and western Kansas any sort of cover should be acceptable to prevent wind erosion, and help facilitate the establishment of grass.
   d. In the event that non irrigated cropping is approved in Kansas the restrictions on hours of field operations currently imposed in Colorado are not conducive to efficient planting and harvesting of crops on any acreage of scale.
3. It came to my attention this morning that any changes to CREP policies in Kansas will require an Environmental Impact Assessment. This adds another delay to meaningful progress, and further complicates a program that is desperately needed to be as user friendly as possible.

Crop Insurance

Wheat receipts at our local coop have been 50-60% of normal for the last three years. Effective crop insurance programs are critical to keeping farms viable in years of extended drought. They will not make a producer rich, but they will keep them in business. Affordable crop insurance is a must have in today's challenging environment.

There are crop insurance regulations that are not conducive to conserving water. In the event that a field is damaged in a hail storm the producer must keep watering it until an adjuster arrives to appraise the field in ten to fourteen days.

Producer, and agent education is an issue. Policy changes at the Risk Management Agency are often not brought to the attention of the affected parties until a claim is being processed. In the past universities did a good job of providing opportunities for education on crop insurance changes, but it seems to be less of a priority now.

As the move towards water conservation continues we will need a more diverse offering of products. These will need to cover different grain crops, as well as better protection options for forage crops.

Culture/Communication

As I have worked with government, and non- government organizations over the past 20 years I have noticed that the relationship has changed between these agencies and the producers that they serve. When I started with the older generation of agents there was more of a partnership, and a spirit of cooperation as both parties worked together to make improvements in farming operations. These older agents wanted their producers to succeed, and thusly were willing to be more flexible as they realized that when dealing with mother nature nothing fits exactly in the box you want to check. We are losing those agents at a rapid rate, their legacy is dying.

Communication is a constant problem. One specific example is a DOC grant for irrigation technology funding became available in March with a two week sign up period. None of the offices in the counties I operate in were aware of the program, and once they were aware each one interpreted the program differently. For the most part there a very good people in these offices they just need to be given the opportunity to succeed.

Summary

In closing I believe that we have all the ingredients to improve things moving forward. We have the people, the science, and the vision to do a better job for the world we live in. I encourage more input

from the producers who have worked this land for generations, more program flexibility, and a culture of cooperation rather than one of administration.

Thank you for the opportunity to provide input on these very important issues.

Testimony

Colorado Field Hearing

United States Senate

Agriculture Committee

Subcommittee on Conservation, Climate, Forestry, and Natural Resources

Hearing on the High Plains: Combatting Drought with Innovation

Wednesday, June 26, 9:00 AM MDT

Burlington, Colorado

Introduction of witness: **Cleave Simpson**

Cleave Simpson is a native of Colorado's San Luis Valley, which is the headwaters of the Rio Grande. He has a degree from the Colorado School of Mines and currently serves as the General Manager of the Rio Grande Water Conservation District. He is also elected as a state of Colorado Senator for the tier of Counties across the southwest border of the State of Colorado. In addition to his roles at the District and in the Colorado General Assembly, Mr. Simpson is the operator of an agricultural operation in the center of the San Luis Valley, with his wife Cathy, where they grow predominantly alfalfa.

The Rio Grande Water Conservation District (RGWCD or District) encompasses most of the watershed of the Rio Grande in Colorado and the center of the District is called the San Luis Valley, thought to be the largest Intermountain Valley in the world. It is approximately 7500 feet above sea level and very flat. The San Luis Valley grows alfalfa and other hay along with, potatoes, wheat, barley, rye and some vegetables.

History:

The Rio Grande basin in Colorado is very different from the Republican River basin where we are meeting today. The Rio Grande receives significant amounts of surface water, coming from snow melt in the surrounding mountains, which was the initial source of the irrigation in the San Luis Valley. Surface water irrigation developed in the period between 1850 and 1870 but by 1900 the streams and rivers of the San Luis Valley were over appropriated, meaning there was insufficient streamflow to serve the needs of all of the irrigators.

The San Luis Valley is underlain by a series of aquifers with a fairly shallow unconfined aquifer (150 feet thick) near the land surface, which, in turn, is underlain by a series of confined aquifers that exist at depths approaching 3000 feet. The surface system streams and the aquifer systems are interconnected to varying degrees with both the unconfined aquifer and the deeper confined aquifers influencing the others water supplies, so consumptive water use from any source has an impact throughout the Valley.

The San Luis Valley rests at 7500 feet above sea level and consequently has a relatively short

growing season from approximately 90 to 120 days depending on the year. The Valley floor receives only an average of 7 inches of precipitation each year, primarily snow, making it one of the dryest producing agricultural areas in the country. This phenomenon requires that any crop being grown must be supported by irrigation. Although available water supply from the surface streams has never been sufficient to serve all of the potentially irrigated land within the San Luis Valley, the recent conditions driven by global climate change, have caused the available supply to reduce even more resulting in the loss of surface water irrigation for many priorities by June or July of each year, which in turn has required the agricultural community to thereafter rely on groundwater irrigation from the underlying aquifers.

Well development began in the early 1900s, until approximately the 1970s, from both the confined and unconfined aquifers to provide this supplemental irrigation for both surface water irrigated lands and as a single supply for well only irrigated lands. For at least 50 years the court system in Colorado, including the Colorado Supreme Court, have determined that the native water supply from both the surface streams and groundwater systems are over appropriated, meaning that the consumptive use from all sources of supply in the San Luis Valley exceeds the average annual water supply from precipitation. As a result, the agricultural producers in the San Luis Valley began to experience declining water levels in the groundwater system and were forced to accept the reality that they had to find a way to reduce the total amount of water use in the San Luis Valley and develop an agricultural economy that matched the average available water supply year-by-year. Only with the achievement of that goal would the San Luis Valley be able to be confident that an active and viable agricultural economy could continue in the future.

Response to shortage:

The San Luis Valley agricultural community, led by the Rio Grande Water Conservation District, determined to reduce the total number of irrigated acres within the Valley. And to thereby reduce the overall pumping from the Valley aquifers in order to ensure the protection of soil health, stream health, wetland health, and community sustainability. Having developed the governmental structures necessary to undertake this effort to purchase existing irrigated agricultural land and return it to native conditions, the local community reached out to the US Department of Agriculture through the Natural Resources Conservation Service and the Farm Service Agency in order to take advantage of several conservation programs that were offered.

In furtherance of their goal of reducing overall consumptive use and irrigated acreage within the San Luis Valley the District entered into cooperative agreements with the State of Colorado and its Department of Agriculture and its Department of Natural Resources in order to ensure that all levels of government were participating in this conservation effort. These agencies initially developed a Conservation Reserve Enhancement Program (CREP) program for one of the more intensely irrigated parts of the Valley and agreed to provide locally funded bonuses in addition to the required cost-share to encourage agriculturalists to include land within the CREP program. In addition, they created an Environmental Quality Incentives Program (EQIP) to also remove irrigated land permanently from production and again provided local funding for a bonus payment to compensate the participants for the inclusion of land in the program to remove acreage from present and future irrigation. Other entities within the San Luis Valley also applied

for Regional Conservation Partnership Program funds and access to other tailored programs. In addition to the use of the available federal programs to support the efforts of the RGWCD, we would like to report, and seek your support of, the unique groundwater easement program being pioneered by the District, local irrigators, with leadership and support from Colorado Open Lands. We seek your support of this unique program as well.

Using all of the available resources offered through USDA programs, the Rio Grande Water Conservation District has defined success as the permanent withdrawal of 40 to 60,000 acres from irrigation, to improve the quality of the irrigated area of this San Luis Valley, achieve sustainable aquifers, improve the environment of the Valley and protect the way of life in the San Luis Valley. After about 20 years of effort the RGWCD has successfully removed approximately 20,000 acres from irrigation.

Challenges created by the current CREP and EQIP programs:

Because of the unique environment in which the San Luis Valley agriculturalist must function, the current legal provisions applicable to the CREP and EQIP programs present significant challenges to the Rio Grande Water Conservation District and its agriculturalists, however many of these issues related to the CREP program are addressed in Senator Bennet and Senator Marshall's CREP Improvement Act, which we hope will be included in any Farm Bill reauthorization:

1. Revegetation. While the program allows a farmer participating in CREP to apply up to 18 inches of irrigation water over the 3 years following the enrollment of the land in the program, this quantity of water may work well if annual precipitation is 20 inches or 30 inches or 40 inches, however it doesn't work at all when the annual precipitation is only 7 inches. We specifically request that the managing agencies of the US Department of Agriculture be given the legal authority to have flexibility to design revegetation programs that can meet the actual circumstances existing on the ground. In the case of the San Luis Valley, it should include the ability to increase the number of years where limited irrigation could occur and to allow for more water to be applied than is currently permitted. Only with a right to apply more water over a longer period of time is there a realistic opportunity to ensure that a permanent natural cover can be created on land that has often been disturbed and managed as irrigated farm ground for close to 100 years.

2. Seed Mix. A second area that must be addressed for conservation programs involving the end of irrigated agriculture and the return of land to native cover is to allow significantly more flexibility in choosing the type of cover crop to be used in highly unique environments. In the San Luis Valley, at 7500 feet above sea level, with a limited duration growing season it is unrealistic to think that simply applying a grass mix that might succeed in the rest of the country will have any chance of success on our farm ground if the hope is that a permanent cover is well established. The natural conditions in the San Luis Valley generally don't include a predominately natural grass cover. The natural vegetation would include forbs and woody stemmed bushes. Choosing seed mix that is predominately gathered from the local species should be encouraged to increase the chance of a successful revegetation and increase producer confidence in the program.

3. Alfalfa. It is one of the predominant crops grown in the San Luis Valley. Although it was not always the case, the cultivation of alfalfa has been encouraged by the shift in the location of the American dairy industry from its historical home in the Midwest to large dairies in the dry Southwest including West Texas, New Mexico, and Arizona. The demand for good-quality alfalfa to support those dairies is intense and as a result alfalfa is often continuously grown on farms and ranches in the San Luis Valley. The CREP and EQIP programs have historically discouraged alfalfa as an eligible crop included under their purview. Alfalfa needs to be made directly eligible for participation in these programs. Although steps in that direction are occurring independent of this testimony it should be emphasized that there is no reason to make it harder for farmers to participate in these programs even if they have engaged in continuous cropping of alfalfa over the past decade or more.

4. Increase the annual payment limit. Currently, a single individual's or entity's annual federal payment is capped at $50,000. We support raising that cap to $125,000 per year. The District understands, and supports, the idea that a limitation on total rental payments is necessary to assure that there is an ability for the small producer to participate in the CREP and not have the entire CREP go to large corporate farms. However, the $50,000 limit is now out of date. The annual CREP rental rate is based on the local per-acre lease rate in arms-length transactions. As you are no doubt aware, the price of irrigated lands within Colorado continue to increase, both for outright purchase and for lease. This increase is long overdue and will allow producers to enroll more than a single irrigated pivot under the program, expanding the number of producers who are eligible to enroll.

Closing.

I would like to thank Sen. Michael Bennet and Sen. Roger Marshall for holding this Field Hearing. Even with my fellow witnesses testifying to conditions in other parts of Colorado and Kansas I hope it is evident that there are significant differences in the proper application of these programs to meet the challenges in parts of the landscape that have little or no rainfall and require total reliance on irrigation to ensure success and even to depend upon irrigation in order to return land removed from irrigated agriculture to a natural uncultivated state. Including the flexibility that I've described today is vital to the health of our communities now and in the future.

Testimony of Curtis E. Sayles, Owner & Manager, CSF Farms - Seibert, CO

U.S. Senate Committee on Agriculture, Subcommittee on Climate, Conservation, Forestry, and Natural Resources

Hearing on: High Plains: Combating Drought with Innovation

June 26, 2024

Chairman Bennet, Ranking Member Marshall, and Members of the Subcommittee:

Thank you for letting me speak to you today on the tools and processes we've been incorporating over the years to combat the erratic weather patterns that seem to be becoming the norm. Our farm is entirely "dryland". This means we do not irrigate any of our crops so we're completely at the mercy of nature for our moisture. The more erratic the weather, obviously, the more erratic the results of our farming endeavors. Obviously to weather these erratic conditions one needs to build resilience into the system.

I'm a fourth generation farmer from Seibert, Colorado just 30 minutes west of where we are today. Most of my family's farming history began in eastern Kansas. My father diverted from that by first going to southeast Kansas, Alberta, Canada and finally eastern Colorado. I was not going to be a farmer. I didn't want to spend the rest of my life "polishing a tractor seat" as it seemed I would. This was a youngster's perspective. Nevertheless, after going off to college and a brief engineering career in the oil industry in Houston Texas, I returned to my farming roots. My father was wanting to expand, and although I enjoyed my engineering work, I didn't care for the big city lifestyle. I returned to help my father in 1980. I married my beautiful wife in 1982. We have three lovely daughters, two great son's-in-law and six charming grandchildren.

We purchased our first farm in 1985. By that time we had already decided to practice "conservation tillage" meaning leaving as much residue on the surface as possible. In addition, we moved to a 2 crop in three year system in a traditionally wheat-fallow area. By 1997, our farm had grown to a point that we needed to hire more help and/or buy more machinery. About this time, Monsanto was sponsoring a conference called "The Main Event". Combine that with a farm tour that included the Dakota Lakes Research Farm, I told my wife that I thought we should pursue the new no-till "thing". It wasn't really new but reintroduced in our area. So, in 1997 we sold all our tillage equipment, bought a sprayer and no-till drill and started continuous crop zero-till. Our crops at that time were wheat, sunflower and millet. Shortly after, we added dryland corn to the rotation. We were noticing some good things in our system. Soil tests indicated that we'd increased our soil organic matter from less than 1% to 2%. That doesn't sound like much but bear in mind that each percent represents 20,000 gallon per acre moisture holding capacity. The soil tests also indicated that our need for added phosphate was decreasing. Even to the point of no recommended addition on some crops. This suggested that the promised nutrient cycling was in fact happening. Water rarely ran out of our fields although it would pour out of the adjacent tilled fields. We had increased our infiltration tremendously. We were starting to build drought resilience in our system. Also, I was so proud that I could take you out into my field and show multiple years of crop residue. There would be wheat stubble, corn stalks and sunflower stalks. I really knew what I was doing.

Unfortunately, there were some bad things going on in our system as well. Our organic matter had plateaued. We struggled to break the 2% barrier. We also had increased our risk by, routinely spending in more than $100,000 in both chemicals and fertilizer. This all came to a head in 2012. The extreme

dry year, high chemical and fertilizer bill and inadequate crop insurance payment was a sobering indication that we didn't have the resilience that we needed. Luckily, we'd built enough equity to get ourselves out of the predicament, but the lesson was learned. About this time, my nephew, who sat on the No-Till on the Plains board, told me I needed to get to that conference. They were talking about this new soil health movement called "Regenerative Agriculture". The conference was in year three of this movement, so the caliber of speaker was beyond beginner. It was much like trying to swallow the water out of a firehose. Not only extremely humbling to a guy who was supposed to "know it all" but mind blowing to learn about how much was going on in the soil biologically and what it could do for our cropping system. In 2014 we decided to adopt the principles of Regenerative Ag. We were already utilizing minimum soil disturbance and leaving the ground covered. Now we started incorporating cover crops and integration of livestock into the rotation. At the same time, we increased our crop diversity by adding cereal rye, oats, buckwheat and safflower to our arsenal. We now utilize polyculture instead of monoculture when possible. About this time, we were introduced to Dr. Meagan Schipanski, a researcher from Colorado State University. She wanted to study the holistic system that we were building from a system-based approach instead of the traditional research model. From this research we learned that the residue I was so proud of was an indicator that our soil was biologically dead. The organic matter plateau was a function of the fallow periods imbedded in our continuous crop zero-till system. Her research showed that the cover crops and grazing were decreasing our bulk modulus, an indicator of increased infiltration, and increasing our soil organic matter. Our organic matter now routinely scores in the upper 2% with some fields breaking 3%. Utilization of the Haney and PLFA soil tests indicate that our soil biological populations are increasing with a corresponding nutrient credit being created. This is pretty much where we stand today.

We didn't get here by ourselves. We've had some government help along the way. In 2015 we enrolled in the Conservation Stewardship Program. The enhancements that were detailed were exactly what we were attempting to employ. Unfortunately, we soon discovered the program was not patterned for large scare utilization. It, at that time, was more designed for small demonstration size projects and not incorporation into a 5000-acre farm. We were forced to withdraw from the program because it was unworkable on our scale. On the other hand, I've heard of numerous examples of people having good luck. The Schipanski research, on the other hand, was invaluable. Not only did we learn, but we received proven verification that our system was performing like we had planned. Following this project we enrolled in the Famers Advancing Regenerative Management Systems program, FARMS for short that was funded by a USDA-NRCS grant. This program supported producers who were building comprehensive soil health management systems on their farms. The program enrolled growers from the Colorado, Kansas and Nebraska area. This put everyone in contact with a broad range of experience, soil type, rainfall and enthusiasm. The most unique trait of the program was the mentor/mentee format in which new adopters had access to long term practitioners for information, advice and, most importantly, support. This program created long term lasting support for Regenerative Agriculture and the techniques learned. Last year we were asked to participate in a Western SARE grant funded project called FARMS Beyond Yield, helping indigenous and black farmers understand and utilize regenerative techniques. Lastly, we've recently enrolled part of our farm into the NRCS Transitional Organic program. This is a three-year program to assist producers during the three-year organic transition period. If successful, we hope to have a regenerative organic acreage in three years.

It's no secret that agriculture is one of the riskier businesses in the U.S. Increasing land prices, increasing input costs, high machinery costs and persistently low commodity prices continuously ratchet up this risk. Earlier this spring, Dr. Jerry Hatfield, Agricultural Research Service Senior Researcher, addressed the 2024 High Plains No-Till Conference and shared that most, if not all, farmers in our region are now farming the soil "B" horizon. To quickly explain, the soil is divided into layers, known

as horizons. The “A” horizon is more commonly known as topsoil, while the “B” horizon is a more basic substrate and so on. The topsoil is the rich, high-carbon layer of soil built up over eons of natural processes, long before man started tilling the soil. The topsoil layer functions as a whole ecosystem, the foundation of which is soil carbon. Tillage exposes this soil carbon to the atmosphere, and triggers its loss as carbon dioxide into the atmosphere. In the High Plains, the intact shortgrass prairie had more than 5% soil organic matter. In the 100 years since the prairie was broke, tillage agriculture has reduced levels of soil organic matter to less than one percent. For many years, conventional tillage was the normal cropping system. It still is for many farmers today. However, tilling the ground is a consumptive system. Meaning the system is always being used up without the ability to rebuilding the resource. I think I’ve always known this fact but hearing it articulated by Dr. Hatfield really hit a note with me and likely resonates with other farmers who grow crops in the former Dust Bowl region. Also, this indicates why sustainable agriculture is not an option. We can’t profitability sustain a degraded resource. If we want to pass on a usable resource, we will need to regenerate it.

I’d like to preface my final comments by saying that I firmly believe that few farmers are intentionally harming the soil. Some may be influenced by tradition, “this is the way we’ve always done it and it works”. It does work, as indicated by the successful producers in agriculture. But at what long term cost. If we keep treating the soil like a growing medium without thought of regenerating it, we’ll be locked into a spiral of increasing fertilizer and chemical usage. Without carbon in the soil, we’re never going to have the resilience to moderate a changing climate. This has to be a philosophical change. I would like my legacy to be a farm where I watch my grandchildren grow up healthy. I’d like not to worry about them, around the farm, getting into something and I’d really like to pass on a farm that is not yoked to chemicals and fertilizers for profitability.

So, I think farmers first must understand that they have a problem. Big items like algae blooms in the Great Lakes and Gulf of Mexico have to be recognized as failures of modern agriculture. I recently read erosion silt is being deposited in the Gulf of Mexico at a rate of two tons per second. I don't know how accurate that is but we’ve all seen the Mississippi. Closer to home we’ve had recent dust bowl day magnitude wind erosion events and adjacent fields washing out the county road with silt because of a one mile, unobstructed erosion run. This is accepted as a cost of doing business instead of something bad that should be avoided.

Traditionally, farmers are long on problems and short on solutions. I may not be any better, but I do have some ideas that I would like to put forward. First, we’ve got to maintain and enhance the main risk tool available to farmers, Federal Crop Insurance. It has to be recognized that crop insurance companies are “for profit companies” and that profit has to be maintained or they leave the arena. As I see it, the first problem with crop insurance is, if you use it, your APH or proven yield goes down (this would be comparable with your auto coverage going down) at the same time your premium goes up. This is a double whammy. If climate change is wide spread across American agriculture, this will be a diminishing risk tool. We experienced this during the 2000 to 2005 drought in our area. Our APH’s have never recovered. Some counties in Colorado cannot continuous crop for some arbitrary reason. The insurance focuses on the immediate crop. This does not fit well with regenerative practices. I may plant a cover crop that adversely impacts the immediate cash crop but provides benefits several years in the future. Sometimes cover crops need to be terminated at an arbitrary date to not impact the cash crop but you loose the advantage of the cover crop. The two entities are fighting each other. Another problem is diverse crop coverage. Currently, non-mainstream crops are not covered by crop insurance. This stifles utilization or forces the grower to utilize NAP insurance. We’ve tried to use NAP and found it to be inadequate. Diversification of crop rotation and risk protection are necessary for widespread adoption of regenerative practices.

Additional research is necessary. However, this research cannot follow the traditional research model. Dr. Schipanski and the research done by CSU showed this. Unfortunately her research term only lasted three years. Regenerative processes take longer. Seven years would be a minimum. The model needs to be holistic long term, system based research. On farm, in the real world is the most realistic.

A Regenerative Produced Standard, much like Organic, needs to be adopted. We are currently working with the Soil Carbon Initiative as they work toward this goal. Their model utilizes a scoring system based on soil health monitoring, continuing education and utilization of regenerative principles. After the participant reaches a certain numeric level they can apply for certification. I would like to note that participation in any government sponsored program supporting regenerative agriculture should require continuing education. There are many conferences across the country that would offer this education and exposure. Many times people enroll in a program for the money, don't know why they're doing it except for the money and abandon the principles once they leave the program. Hopefully continuing education would combat that issue.

One of the potential advantages of regeneratively grown production is increased nutrient density. To my knowledge, a study was done in the 1940's and again in the 1990's. The latter study showed dramatic reductions in trace elements in both grain and meat. I would like to see independent research done on regeneratively grown crops and meat. If this is a fact, the consumer and ag producers need to know.

Finally, markets and infrastructure needs to be developed for regeneratively produced products. At this time, much that is produced regeneratively has to be dumped into the commodity pipeline and the identity is lost. I don't think this is an area that the government should be picking winners and losers. However, a grant system for farmer groups or individual entrepreneurs, who demonstrate genuine regenerative processes, would allow this development. In addition, many times regulations are patterned to advantage large scale producers and processors. If wide spread adoption of regenerative agriculture is the goal, then getting the production to the consumer is paramount. General Mills and King Arthur Flour are just two examples of companies attempting to take advantage of the consumers desire for this type of production.

In conclusion, Regenerative Agriculture is a farmer driven movement. That is why I think it will succeed. I'm cautious to suggest the government jump in the middle of the progress. However, if society wants to go this way, government has a responsibility to assist. If our environment continues to track toward the erratic, farmers are going to have to adjust to protect the soil to continue to produce. That is the resilience we must foster. Drought resilience, economic resilience and agronomic resilience must all be pursued.

Thank you for letting me testify about a movement that I'm passionate about. I've thrown a lot on the table. Maybe I haven't provided solutions but hope I've suggested places to start looking. I look forward to watching the results of this hearing.

Written Statement of Carlyle Currier
President, Colorado Farm Bureau

The United States Senate Committee on Agriculture, Nutrition and Forestry,
Subcommittee on Conservation, Climate, Forestry, and Natural Resources
"Hearing on the High Plains: Combating Drought with Innovation"
June 26, 2024

Chairman Bennet, Ranking Member Marshall and members of the ag committee,

My name is Caryle Currier and I serve as President of the Colorado Farm Bureau—our state's largest general farming organization representing all four corners of the state and all commodities. In terms of people, that's about 13,000 rural Coloradans. I'm also on the Board of the American Farm Bureau Federation. I want to thank you all for the invitation to participate in today's proceedings as we discuss the compounding challenges and opportunities ushered by a drier, more arid future.

I'm the fourth generation on my family ranch, located on the western slope of Colorado in a rural farming community in and around Molina, CO. My son, Joel, will be the fifth generation to raise beef cattle, grow hay and small grains from our home in Mesa County.

In my volunteer capacities, I've been fortunate to work with many groups intent on finding adaptations to hotter, drier times. The need for innovation becomes increasingly urgent with each drought cycle. Here in Colorado, our farmers and ranchers have adapted because dwindling water supplies ***demanded it.*** Where I'm from, our high-elevation pastures are often flood-irrigated. Our producers have improved efficiencies in flood irrigation over the years, and in doing so we provide a couple of important, ***low cost trade-offs*** for the irrigation water we use. For example:

1. We slow water down and provide water for downstream ecological benefits, like water for wildlife, and shallow mountain aquifer recharge. We also benefit downstream users throughout each of the seasons. This trade-off provides consistency whether we're talking about our role in delivery through Colorado River compact compliance or sustainability of our ecosystems.
2. We produce the most nutrient-dense, consumable, and affordable protein in the world. Our ability to use water to grow forage that we feed to livestock results in dividends that shore up food security issues domestically. This assurance trade-off should not be dismissed.

Additionally, farmers and ranchers in the West play a critical role on federal lands by improving range conditions, preventing wildfires, and maintaining healthy watersheds through grazing. Ranchers with federal grazing permits utilize land that is often ill suited for other kinds of production because of a lack of water in these remote landscapes. Because we're here to talk about water, I'd like to offer that, specifically, grazing on federal lands increases water yields, improves soil structure and assists with water storage and filtration. A strong partnership between federal agencies and local grazing permittees is key to maintaining these ecosystem services. I've been fortunate enough to have good working relationships with personnel at the Grand Mesa National Forest, where I take my cattle in the summertime. Again, they recognize the important trade-offs and contributions of multiple use on federal lands as opposed to an exclusionary preservation designation.

There are many other ways agriculture is part of the solution for the future we are facing, but our continued contributions depend on the continued respect of our state's administration of water rights and the private property protection that the prior appropriation system provides. Often, this system creates tension between growing urban centers that need water resources and an agriculture industry that may be hurting during difficult times. "Buy and dry" programs, as a stop-gap for

conserving water during periods of peak urban and municipal expansion, have consequences. "Buy and dry" imperatives do not bode well for a state's economy that depends on agriculture's $9.2 billion dollars of sales contributions.[1] We at Colorado Farm Bureau think "buy and dry" programs are to be cautioned against because of the consequences to our rural communities and economies, should the support of agriculture be withdrawn or abandoned. USDA is certainly recognizing the importance of rural investment when it comes to helping farmers in rural areas experiencing distress from drought, etc. But surely, we can do more.

We need solutions that fuel long-term rural economic development and provide ***multiple benefits***, like Senator Bennet's "Healthy Watersheds and Healthy Communities Act". I recently heard our Colorado Congresswoman Caraveo say, when speaking about our nation's transition to renewable energy sources, that it must make sense for farmers' and ranchers' economic bottom line to be successful. I believe that's equally as true when we talk about management of our water resources. There must be a balance between resource stewardship and economic viability. If farmers and ranchers are expected to take on the risk of modifying with new precision or conservation technologies, there must be incentives. The "Healthy Watershed and Healthy Communities Act" provides the right kind of

[1] USDA "Investing in Colorado" Report, June 2024

common sense incentives by leveraging federal investment against private and public partnerships. It also streamlines our planning processes and empowers our proven, local efforts already underway at our state and county levels.

As a founding member of the Colorado Ag Water Alliance (CAWA) and past Chairman, I know intimately that our needs for water are diverse, and we must avoid a "one size fits all" approach to our water woes across the arid west. By simply reducing cumbersome paperwork requirements and streamlining ideas, CAWA secured funding from the Colorado Water Conservation Board (CWCB) and supported a diverse group of water projects all with the targeted objective of drought resiliency. They gathered the data from respective projects and are now leading the way with solutions that we know will help get us through this hotter and drier future. They are varied in method, but projects of all shapes, sizes, and duration are part of the equation.

We must also strive for more permanent funding for current ad-hoc and disaster assistance programs. In 2023 major disasters and severe weather accounted for over $16.5 billion in total crop losses—Colorado, for our part, contributed to $227 million of that just from drought, wildfire, and heat alone.[2]

[2] American Farm Bureau Calculations, USDA Risk Management Agency as of 2/27/2024

Programs like ELAP (Emergency Assistance for Livestock, Honey Bees, and Farm Raised Fish) and improvements to the emergency grazing protocols for CRP have helped and could continue to help farmers and ranchers bridge gaps in cash flows at times when they so desperately need them. We also hope you'll consider expansions and improvements to LRP (Livestock Risk Protection) and PRF Insurance (Pasture Rangeland and Forage) as tools to assist farmers and ranchers with drought.

In closing, I suggest our federal partners be mindful of the following points as they work to address drought through meaningful policy:

1. Remember the trade-offs provided by ag uses of water, and how cost-effective they are.
2. Elevate multiple-use doctrine in discussions about resource conservation.
3. Continue to respect the states' administration of water rights. Do no harm, and think critically about "buy and dry" programs.
4. Encourage continued investment by USDA and RMA in the areas of rural economic development, disaster relief (and find ways to make it more permanent), and expand LRP and PRF programs.

5. Leverage public-private investment. Support Senator Bennet's "Healthy Watersheds and Healthy Communities Act".
6. And finally, trust and support local efforts by proven groups with experience and track records.

Thank you for your time today and the opportunity to contribute to the discussion. I hope you will consider myself and the Colorado Farm Bureau to be a resource when it comes to ideas that help protect and support our nation's resources and rural communities.

Jeff Sternberger
Midwest Feeders, Inc. – Ingalls, Kansas

"Hearing on the High Plains: Combating Drought with Innovation"
U.S. Senate Committee on Agriculture, Nutrition, and Forestry; Subcommittee on Conservation, Climate, Forestry, and Natural Resources
June 26, 2024

Chairman Bennet and Ranking Member Marshall, thank you for allowing me the opportunity to testify today. My name is Jeff Sternberger and I am General Manager and co-owner of Midwest Feeders, Inc., located in southwest Kansas near Ingalls. I am a past president of the Kansas Livestock Association (KLA) and a member of the KLA Water Committee and the National Cattlemen's Beef Association (NCBA). I also serve on the Board of Directors of U.S. Premium Beef, a producer-owned, vertically integrated beef company. My wife, Colleen, and I also own farming and ranching operations in Kansas and Oklahoma. I have a bachelor's degree in agricultural economics from Oklahoma State University.

Midwest Feeders is a 90,000-head custom cattle feeding operation. The majority of the cattle in our feedyard are owned by other cattle producers. Our team provides feed and animal care during the finishing phase. While we raise some of the forage and grain needed to feed the cattle in our care, the vast majority is purchased from farmers in the region.

My testimony today will focus on our efforts to conserve water. The primary water source in southwest Kansas is groundwater from the Ogallala aquifer. Depletion of the aquifer has received considerable attention in the last few years. As stakeholders have developed a better understanding of the rate of depletion, discussions around water use reductions and conservation has accelerated.

While efforts have accelerated recently, our operation has been implementing practices to use water more efficiently for many years. These efforts go back 30-plus years as irrigation water rights were converted to stockwater rights. These water rights were exercised using flood irrigation technology. Water was conserved simply by shifting away from the less efficient flood irrigation system. Converting water rights from irrigation to stockwater also results in reduced water use.

In 2018, we enrolled multiple water rights in a Water Conservation Area, or WCA. The WCA allowed us flexibility in how we utilized our water rights in exchange for reducing our historical irrigation use by 10%. The flexibility allowed us to more efficiently use water from multiple rights in our integrated system that supplies water to the cattle in our feedyard.

In 2019, we completed an expansion that added additional capacity to our feedyard. As part of that expansion, we installed a water recycling system that captures overflow from the waterers in part of the feedyard. The water savings from the recycling system has averaged between one- to

two-gallons per head per day. For comparison, our typical water consumption across the feedyard averages nine- to ten-gallons per head per day. We completed another facility expansion in 2022 that included another recycling system. We have seen similar water savings in that system as well.

We also have looked to more sustainable water sources for our operation. In 2021, we submitted a new appropriation application in the Dakota formation. This formation has different recharge characteristics and provides an alternative to our Ogallala rights.

As we have expanded our feeding capacity, we produce more effluent. Our waste retention structures allow us to capture the effluent and apply it to crop fields. The effluent replaces a portion of the water needed for irrigation and commercial fertilizer needed for crop production.

I mentioned earlier that our water consumption averages between nine- and ten-gallons per head per day. The day-to-day number varies depending on the size of the cattle and the time of the year. We believe we are very efficient with our water resources given Kansas Department of Agriculture – Division of Water Resources standards are 15 gallons per head per day.

The investments we have made have allowed us to use water more efficiently. That's essential to the long-term viability of our operation. Our viability also is dependent on the forage and grains produced by farmers in our area. Last year, we began meeting with neighboring farmers to discuss the potential of extending water conservation efforts to farms in the area. We believe there is potential to use a WCA to realize water conservation while still providing the revenue necessary for the farming operation and growing the forage and grains we need in our cattle feeding operation. If we are successful, we know other feedyards will take a similar approach in their area.

We have been fortunate to be able to make significant investments in our operation to achieve water conservation. From a policy standpoint, support from the federal level would accelerate investment across cattle feeding, dairy production, and farming. I suggest you consider cost-share programs and tax credits as options that would support investment in technologies that provide water savings. The upcoming farm bill discussion would be an opportunity to expand conservation programs to include these types of investments.

In terms of other farm bill issues, I strongly oppose any type of mandates in terms of how cattle are marketed. KLA, NCBA, and the vast majority of cattle producers across the country want to decide how to best market their cattle, not have the federal government dictate how cattle can be marketed. In addition, I would encourage your support for voluntary conservation programs like the Environmental Quality Incentives Program and expand their availability to livestock producers. I also support strengthening efforts to prevent, contain, and eradicate foreign animal diseases.

Thank you again for the opportunity to testify today.

HEARING ON THE HIGH PLAINS:
Combating Drought with Innovation

TESTIMONY

Presented to:

Senate Agriculture Subcommittee on Conservation, Climate, Forestry, and Natural Resources

Wednesday, June 26, 2024
Burlington, Colorado

Presented by:

Amy France
Scott City, Kansas

Thank you Chairman Benett, Ranking Member Marshall, and members of this Subcommittee for the opportunity to speak at today's Hearing on the High Plains: Combating Drought with Innovation. My name is Amy France and my family and I farm and raise livestock in western Kansas. It is an honor to discuss how the farmers and ranchers on the High Plains are managing, conserving, and extending the life of our limited water resources, particularly the Ogallala Aquifer, in this important agricultural region. I also want to express my gratitude to Senator Marshall for his leadership and commitment to Kansas agriculture throughout his time in Congress and to the grassroots, bipartisan work across state lines being done with the Senate offices down to the groundwater management and farmer levels.

I own and operate France Family Farms in Scott County, Kansas, alongside my husband and our oldest son. We primarily raise grain sorghum, corn, and wheat as well as Angus cattle on our 6,000 acre operation. As third-generation farmers in Western Kansas, we live with the impact of drought and limited water resources and have first-hand experience with the importance of water conservation efforts in agriculture.

The High Plains is a harsh climate that includes limited precipitation and extreme temperatures. Figure 1 shows the evapotranspiration line established by the US Geological Survey (USGS) which contrasts potential evapotranspiration with average precipitation. Lands to the west of this line, which encompasses much of Kansas including my county, typically lose more moisture to evapotranspiration than they received via annual precipitation[1]. Additionally, we continue to see more erratic weather patterns with precipitation becoming increasingly variable.

According to the U.S. Drought Monitor, Scott County in western Kansas has consistently experienced drought conditions for the past several years and was categorized as the most severe, a D4 Exceptional Drought, from June 2022 though May 2023.[2] The outlook for this area is grim, as the Climate Prediction Center anticipates that current drought conditions will persist for at

[1] https://www.usgs.gov/media/images/map-gridded-values-1971-2000-avg-precipitation-minus-avg-pet
[2]https://www.drought.gov/states/kansas/county/scott

least the next several months.[3] In Scott County alone, moderate drought conditions persist over more than 25% of the county, with the remainder being considered abnormally dry by USDA.[4]

Many farmers throughout the High Plains have had the luxury of using the region's aquifer as a resource to irrigate their crops. Unfortunately, the Ogallala Aquifer is on an unsustainable trajectory due to over-appropriation and prolonged drought conditions. However, conservation practices, collaborative partnerships, and resource conserving crop rotations are helping to preserve this critical water resource for agricultural, industrial and municipal needs.

Because sorghum is more efficient in the use of water than other crops, it is a key tool for enhancing the overall sustainability and profitability of my family farm. Sorghum, the Resource Conversing Crop®, is a drought tolerant, non-fragile, high-residue crop that conserves soil moisture and reduces soil erosion. Adding sorghum to a typical high input crop rotation allows the entire rotation system to become resource conserving, according to the USDA.[5] Despite the harsh and fragile nature of the High Plains, this region still produces three-fourths of the entire sorghum crop in the U.S. as a result of these cropping systems and other practice changes.

As farmers, we must do our part to implement effective water management. In doing so, we look to new technologies and improved practices that can be tailored to the region such as precision planting, chemical and nutrient applications and precision irrigation technology. According to a study conducted in 2020, 24% of irrigated acres over the Ogallala aquifer will no longer be able to support irrigated agriculture by 2100.[6] This of course, is assuming no changes in water management occur. From my perspective, federal, state and local policies need to deliver actual water savings in the Ogallala aquifer.

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[3] https://www.drought.gov/data-maps-tools/us-monthly-drought-outlook
[4] https://downloads.usda.library.cornell.edu/usda-esmis/files/cj82k728n/sj13bs95f/mk61t777r/wwcb2424.pdf
[5] https://www.regulations.gov/document/CCC_FRDOC_0001-0413
[6] https://www.sciencedirect.com/science/article/abs/pii/S0378377419318062

My family farm has a limited amount of irrigation, and the vast majority of our crops are grown under dryland, rainfed production practices. While my family has chosen dryland crops, there are many producers in my area looking to introduce innovative solutions to on-farm irrigation.

The Southwest Kansas Groundwater Management District #3 (GMD3) has actively engaged with farmers in their region, as well as with Colorado producers and elected officials on both sides of the state line. GMD3 helps producers benchmark their irrigation performance against other area producers, provide technical assistance for growers to make improvements to their irrigation practices, and educates producers and the public about the need for water savings to help stabilize the Ogallala aquifer.

We appreciate the efforts of Senator's Bennet, Moran, Lujan and Heinrich for introducing legislation (S. 2250) to allow farmers to convert irrigated acres to dryland by placing their water rights into a voluntary conservation easement. This creates water savings that are attributed directly back to the aquifer, helping to reduce over-appropriation and to stabilize this important resource.

Innovation in water conservation spans beyond irrigation practices and easements. Farmers should be encouraged to implement practices that decrease resource use and increase sustainability. On France Family Farms, we make every effort to ensure that our farming practices are good for the land - for today and for future generations.

The agriculture sector has put great time and effort into keeping pace with technological advances and other conservation efforts in response to both market and environmental demands. As a farmer on the High Plains, my vision is to make agriculture more sustainable so that future generations can have the same opportunities we have today. Farmers are tasked with the difficult challenge of feeding the world. Our livelihood, as well as those generations who follow us, are absolutely dependent on a stable water supply. Mr. Chairman, we can do this by adapting new technologies, improving practices and policies, and harnessing the inherent attributes of drought resilient crops like sorghum. I thank you and the subcommittee for your time today and for your

proactive and collaborative approach to this critical issue for agriculture. I am happy to answer any questions.

FIGURE 1

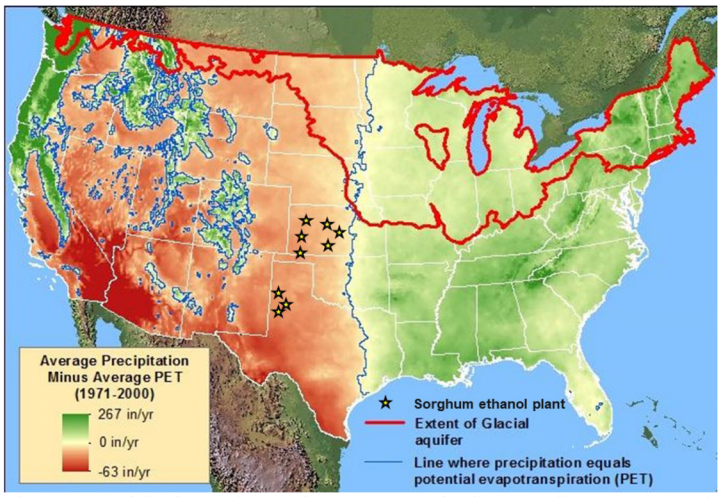

Figure 1. Precipitation and Potential Evapotranspiration as well as Sorghum Ethanol Plant Locations

Data Source: https://www.usgs.gov/media/images/map-gridded-values-1971-2000-avg-precipitation-minus-avg-pet

FIGURE 2

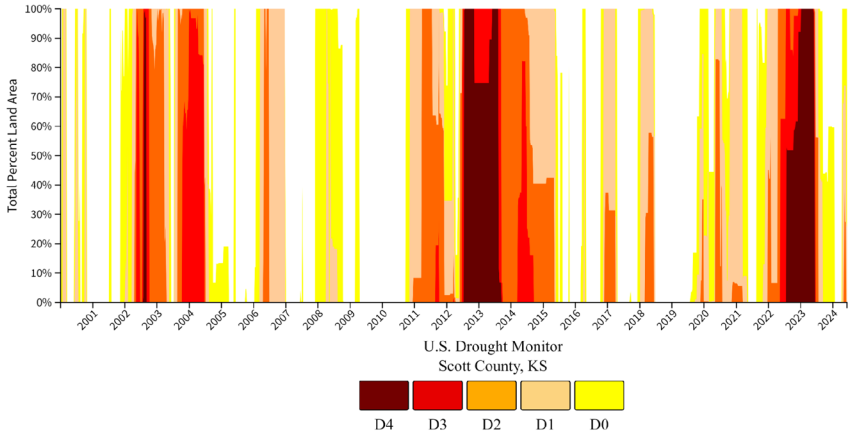

Figure 2. Summary of Drought Conditions, 2000 through 2024 for Scott County, KS.

Data Source: https://www.drought.gov/states/kansas/county/Scott.

FIGURE 3

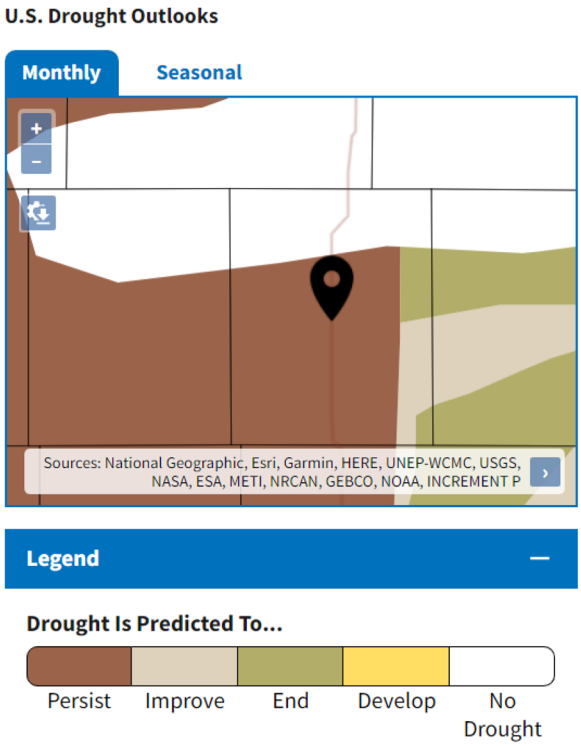

Figure 3. Drought Outlook for Scott County, Kansas

Data Source: https://www.cpc.ncep.noaa.gov/

Statement of Sarah Parmar, Director of Conservation
Colorado Open Lands

Hearing on the High Plains: Combating Drought with Innovation
Hearing of Subcommittee on Conservation, Climate, Forestry, and Natural Resources United States Senate

June 26, 2024

Chairman Bennet, Ranking Member Marshall, members of the subcommittee, thank you for the opportunity to speak with you today about the nexus between your work and mine.

My name is Sarah Parmar and I am the Director of Conservation for Colorado Open Lands, a nonprofit organization which has worked for over 40 years to conserve land and water for people and wildlife. Colorado Open Lands holds over 700 conservation easements on more than 680,000 acres and 720 water rights across the state, the majority of which are working lands stewarded by dedicated agricultural landowners or land managers. As many of you may know, a conservation easement is a voluntary, legal agreement that permanently limits uses of the land in order to protect the conservation values, or public benefits that flow from the land. Colorado Open Lands has worked to protect agricultural lands and water rights because we understand that continued irrigation in rural communities is the cornerstone of the ecology, economy, scenic views and heritage that we all value.

As a conservation community, and particularly within the land trust community, we have been largely focused on land use changes. Conservation easements have become a trusted proven tool for maintaining land use that supports wildlife habitat, food production, and viewsheds, and preventing incompatible land use that threatens those values. While conservation easements have been a powerful tool to protect Colorado's land, there are challenges to their effectiveness to address these growing pressures on water rights. Historically in Colorado, conservation easements have included water rights, requiring that the water stay with the land and that the landowner continue to use their water for irrigation. This traditional approach fails to address threats to water supply and may limit innovative approaches to water conservation and water sharing that could meet multiple needs. As we face a future of increased pressure on our water resources, I believe that the decisions we make about water will have a greater impact on our Western landscapes than land use decisions. Therefore, it is imperative that we understand water issues and adapt and innovate our conservation tools to support communities as they work to build resilience in the face of a changing climate and growing population.

We are fortunate in Colorado that when Senator Hickenlooper was Governor of Colorado, he commissioned a state water plan which identified gaps in Colorado's projected demands for water with its supply. The plan identified two significant drivers of loss of irrigated land in Colorado: conversion of agricultural water rights to municipal water rights and the decline of groundwater aquifers. I believe that conservation easements can be employed as a tool in the toolbox we will need to find creative, flexible solutions to these water challenges.

Take, for example, the South Platte River Basin, Colorado's bread basket, where farms are facing ever-increasing pressure from cities seeking out agricultural properties with water rights for conversion to municipal and industrial uses. This practice of "buying and drying" farms has consumed thousands of acres of farmland in the last 30 years, leaving some land barren and unproductive, with far reaching consequences such as soil erosion, lack of water recharge into aquifers, fragmented and damaged wildlife habitat, impacts on local agricultural economies, and issues related to food security. Colorado's South Platte River basin currently supports 850,000 acres of irrigated farmland and fuels nearly 75% of

Colorado's agricultural economy. However, the Colorado Water Plan projects that the basin could lose up to 50% of its irrigated lands by 2050 if current "buy and dry" practices continue.[1]. The Basin has already borne much of the state's recent rapid population growth. The trend is expected to continue, with the Basin absorbing between 42% - 70% of the state's new population growth by 2050.[2] This development may grow directly onto former farmland, as we so often see closer to the Front Range, but can also take the form of municipal interests purchasing water rights more than a hundred miles away, deep into rural communities, where the removal of that water will forever alter the ecology and remove the community's economic building blocks. The most significant challenge for this basin will be how to address the increasing needs of thirsty, rapidly expanding cities, while balancing the intertwined agricultural and environmental values of our state, which are supported by water use.

Rather than competing with cities and forcing farmers to choose between selling water for a premium or continuing to farm, Colorado Open Lands is offering a third path. We have developed more flexible conservation easement language that ensures that water rights can never be permanently stripped from the land, but that allows for collaborative water sharing. By placing farms and their water rights into conservation easements that prevent the separate sale or wholesale change of water, yet allow for leasing, we can encourage cities to lease water in times of shortage and for drought recovery, and provide farmers stability, ongoing ownership, and the opportunity to diversify their income with lease payments in dry years.

This flexible water language is now a staple of our conservation easement templates in the South Platte Basin and we are taking the next step of trying to scale up the pace and impact of this work through a modified "buy, protect, sell" model. Developers and water providers have a competitive advantage with access to capital that the next generation of agricultural producers do not have. The value of water rights has skyrocketed in the last decade, such that even very successful established producers cannot afford to purchase farmland because of its astronomical water value, making it that more unattainable for a new generation to access agricultural land and the water needed to make it productive. The removal of the speculative value of the water rights through a conservation easement also creates a farm or ranch which has a value closer to its agricultural production value, making it more affordable and accessible for agricultural producers. However, many farmers or ranchers may not have the time or capacity to work on a conservation easement and may simply want to sell; they may wish to have their land continue in agriculture, but need the market rate driven by water prices. We are beginning to work with interested ditch companies and communities to buy farmland as it comes on the market, put conservation easements and collaborative water sharing agreements into place to conserve the land while providing some needed water supply off farm, and then convey that farmland to a young farmer. Colorado Open Lands believes this presents an opportunity for collective purchasing to protect water rights in a way that may be difficult for any individual, while also expanding land access for beginning farmers and ranchers.

The other crisis impacting irrigated farms and ranches and rural communities, here in Colorado and throughout the west, is an invisible one: the shrinking aquifers beneath us. A little more than 1/3 of

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[1] Colorado Water Conservation Board. "Colorado Water Plan 2023." Colorado Department of Natural Resources, January 2023. https://dnrweblink.state.co.us/CWCB/0/edoc/219188/Colorado_WaterPlan_2023_Digital.pdf.

[2] Colorado Water Conservation Board. "South Platte Basin Implementation Plan." Colorado Department of Natural Resources, January 2022. https://dnrweblink.state.co.us/cwcbsearch/0/edoc/216719/South_Platte-Metro_BIP_Volume1_2022.pdf.

America's drinking water comes from groundwater, with small and rural communities disproportionately relying on well systems.[3] Approximately 40% of American agriculture is dependent on groundwater.[4] Last year, the NY Times reported that of the 84,544 wells nationwide tracked since the 1920s, nearly half have declined significantly over the last 40 years, with this trend spanning the country, from California to Maryland.[5] While groundwater administration varies from state to state (and sometimes within states) there is a growing awareness that a failure to act on groundwater conservation will cause irreparable harm, particularly in rural communities who may lose both access to drinking water and the irrigation water critical for their economic agricultural base.

As the Rio Grande River journeys from its headwaters within the San Juan Mountains, it flows through Colorado's San Luis Valley, the largest alpine valley on earth and the highest valley capable of sustaining large scale crop production. While the San Luis Valley is unique in many ways, it shares a common resource challenge with many places around the United States – a declining groundwater aquifer. Groundwater pumping for irrigation beyond the recharge capacity of the basin is causing injurious depletion to senior surface water rights holders and may be impacting riparian ecosystems. A historic drought in 2002 revealed the unsustainable nature of the current level of groundwater withdrawals, leading the state of Colorado to impose a deadline for the community to come to a solution or face a shutdown of groundwater wells. If the state's mandate to replace injurious well pumping and to bring the aquifers back to sustainable production levels cannot be met, there is a serious risk that thousands of wells will be shutdown. Such an order was just announced in Idaho within the last month, when the state's water agency ordered the shutdown of wells which could impact half a million acres of agricultural land, in what is being described as the largest curtailment in the state's history. If a similar sudden shutdown of wells were to occur in the San Luis Valley, it will have catastrophic socioeconomic and environmental impacts.

In the San Luis Valley, irrigated agriculture is critical because it drives the majority of the region's economic activity and creates food sources and habitat for migrating birds and wildlife. A recent comprehensive wetland conservation survey found that 70% of wetland acres in the San Luis Valley are found on private lands fed by irrigation; this rich wetland network, supported by irrigation and impacted by groundwater levels, provides critical habitat for a variety of waterfowl and most prominently, for the thousands of Sandhill Cranes that stopover in fall and spring [6]. Irrigated agriculture contributes over $357

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[3] US Geological Society "Depth of groundwater used for drinking-water supplies in the United States." November 18, 2021. https://www.usgs.gov/publications/depth-groundwater-used-drinking-water-supplies-united-states.

[4] National Agricultural Statistics Service. "2018 Irrigation and Water Management Survey." US Department of Agriculture. https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Farm_and_Ranch_Irrigation_Survey/index.php.

[5] America Is Using Up Its Groundwater Like There's No Tomorrow. Mira Rojanasakul, Christopher Flavelle, Blacki Migliozzi and Eli Murray. Aug. 28, 2023. https://www.nytimes.com/interactive/2023/08/28/climate/groundwater-drying-climate-change.html.

[6] Wetland Dynamics, LLC. "San Luis Valley Wetland and Wildlife Conservation Assessment, Second Edition." May 8, 2019. https://wetlanddynamics.com/wp-content/uploads/2020/04/SLVWetlandWildlifeConservationAssessment_Final_Edition2.pdf

million in production and accounts for one-third of the region's base economy.[7] With a forced well shutdown looming from the state engineer's office, producers face the prospect of receiving no payment to retire wells. A forced shutdown from the state could be devastating to the interconnected web of producers, local businesses and households. One study estimated a 24,500 (AF) reduction equally split between irrigators without landowner compensation could reduce the economic output of the region by approximately $30 million – a devastating blow in a region with limited alternative economic opportunities.[8] While a regulatory shutdown could solve the singular issue of unsustainable groundwater pumping, it would create other issues, impacting wetlands, and inequitably harming farm families, especially those on the margins.

Producers in the San Luis Valley have not had their heads in the sand, but instead have been working for decades to avoid direct state intervention in the form of well shutdowns. Irrigators from six groundwater subdistricts of the Rio Grande Water Conservation District and one subdistrict of the Trinchera Water Conservancy District are participating in voluntary programs to reduce groundwater pumping. To achieve pumping reductions, the subdistricts currently utilize the Conservation Reserve Enhancement Program (CREP) and short-term fallow programs and drought contracts. However, in the context of ongoing droughts and given the necessary volume of recharge, the scale of these efforts is insufficient to achieve basin sustainability as quickly as needed.

In 2018, Colorado Open Lands and the Rio Grande Headwaters Land Trust, two Colorado non-profit land conservation organizations focused on land and water conservation in the San Luis Valley, began conversations with the Rio Grande Water Conservation District, San Luis Valley Water Conservancy District, and Conejos Water Conservancy District to explore whether and how traditional land conservation tools, especially conservation easements, might be modified to focus on groundwater depletion.

As partners, we began by hosting listening sessions in each of the seven groundwater subdistricts to understand what kind of a program would be of interest to irrigators to support their voluntary reduction of groundwater. The feedback from producers was that many of them are not interested in a program that requires full fallow of their land. They want to be part of the solution, but many want to remain in agriculture, so are interested in compensation for reduction, but with the ability to use less water, and especially the flexibility to shift water across their farm fields. What we heard from water managers was that permanence of water savings in the aquifer would be critical to avoid a yo-yo effect in storage. All agreed that certainty is valuable for planning and investment and that investment could not come from the community alone, when already, the median household income in the San Luis Valley is much lower than that of the average household in Colorado (60% lower in 2010).[9]

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[7] San Luis Valley Development Resource Group and Council of Governments. "2022 Annual Comprehensive Economic Development Strategy (CEDS) and Progress Report." December 31, 2022. https://www.slvdrg.org/wp-content/uploads/2023/06/2022-SLVDRG-EDA-Annual-Report.pdf.

[8] Rebecca Hill James Pritchett. "Economic Impact Analysis and Regional Activity Tool for Alternative Irrigated Cropping in the San Luis Valley." Colorado State University. August 2016. https://watercenter.colostate.edu/wp-content/uploads/sites/33/2020/03/SR28.pdf

[9] Early Childhood Council of the San Luis Valley. "Community Assessment of the San Luis Valley." 2016. https://www.slvdrg.org/wp-content/uploads/2017/05/Economic-Impact-Analysis-and-Regional-Activity-Tool-for-Alternative-Irrigated-Cropping-in-the-San-Luis-Valley.pdf.

A working group consisting of the partners, together with staff of the Colorado Division of Water Resources, water attorneys, a conservation easement attorney, and appraiser with expertise in both water rights and conservation easements, embarked on a feasibility study to adapt a traditional conservation easement as a tool to address aquifer decline. We believe that we have created a tool with the following qualities: a conservation easement can be permanent and legally enforceable in perpetuity, it can qualify for tax incentives and/or funding incentives, including Farm Bill programs, it can be tailored to a specific region and a specific property, and it can support water reduction with agricultural production, specifying a permanent amount of pumping reduction, while allowing the landowner to manage how they achieve water savings.[10]

Colorado Open Lands completed the first groundwater conservation easement on a farm in the northern part of the San Luis Valley which will save 1,700 acre-feet per year (enough to support approximately 3,500 households). The water savings from this farm allows the other farms in that groundwater district to continue irrigation. The farm is hydrologically connected to San Luis Creek, supporting wetlands and key habitat. The groundwater pumping reductions on the farm will help in the recovery of the confined aquifer and, in turn, help support resilient habitat communities on significant wildlife lands to the south, including the Baca National Wildlife Refuge. Compensation for this conservation easement was determined through an appraisal, which considered comparable sales of fully irrigated farms to sales of farms which were water-short, to determine the value of the foregone groundwater pumping. This landowner utilized Colorado's state income tax credit for conservation easements, claimed a federal tax deduction, and was partially compensated by a state grant to Colorado Open Lands, as well as funding from a private foundation.

Colorado Open Lands explored funding for groundwater conservation easements under the Agricultural Conservation Easement Program (ACEP); however, because the purpose of that program has been to maintain agricultural viability, national staff had concerns that reducing irrigation or changing the type of agricultural production that is feasible through a groundwater conservation easement could be incompatible. Colorado Open Lands was encouraged to pursue a Regional Conservation Partnership Program (RCPP) grant as an alternative and was awarded funds to partially purchase voluntary groundwater conservation easements that will restrict pumping to allow for aquifer recovery with continued agricultural use and to pay for land management expenses to transition agricultural operations under different scenarios that will protect soil health and wildlife habitat.

I am incredibly grateful for the exceptional staff we have working for the Natural Resources Conservation Service in Colorado, including Ron Riggenbach, District Conservationist in the San Luis Valley, Laura Trimboli, Colorado Easement Program Manager, and especially for the leadership of our State Conservationist, Clint Evans. They all care deeply about the issues facing Colorado and constantly work to find creative solutions to stumbling blocks. Since 2000, Colorado Open Lands has partnered with NRCS to conserve nearly 50 farms and ranches across Colorado, and we are now a Certified Entity for purposes of the Agricultural Conservation Easement Program.

It was under the leadership of Mr. Evans that the agency approved our flexible water rights language to support alternatives to buy and dry. He has supported our work to break down barriers to conservation of small farms irrigated by Historically Underserved Producers in the San Luis Valley whose title to land is complicated by the integration of the Mexican Land Grants into the United States Public Land Survey

[10] Colorado Open Lands. "Water Conservation" 2024. https://coloradoopenlands.org/water-conservation/.

System. However, despite our phenomenal partners here in Colorado and our organizational experience successfully implementing Farm Bill Programs, we have found the Regional Conservation Partnership Program to be exceptionally challenging to utilize for conservation easements, and an impediment to achieving the impacts we hoped to see with regard to aquifer recovery in the San Luis Valley.

On the other hand, the Agricultural Conservation Easement Program, or ACEP, is widely known and utilized and has program staff who understand real estate transactions. I believe that the creation of a Groundwater Conservation Easement Program under ACEP, as called for in the Voluntary Groundwater Conservation Act sponsored by Senator Bennet, would create the necessary purpose and provide an impetus for the agency to build expertise in water rights (or delegate authority to State Conservationists who can work with entities like COL to demonstrate compliance with state water law in order to enact and enforce groundwater conservation easements). The creation of even a pilot program in the upcoming Farm Bill reauthorization would enable NRCS and partners to undertake the necessary trial and error inherently involved in the development and successful implementation of a new tool under different water law and administrative regimes. State block grant funding could also allow for adoption of accurate and precise measurement of groundwater withdrawals.

I applaud this Subcommittee and the full Agriculture Committees of both the House and Senate for including much needed funding increases for conservation programs, together with increased cost-share to landowners for the Agricultural Conservation Easement Program and needed changes to easement administration as part of existing Farm Bill proposals. I ask that you consider conservation easements as a tool for land access and continue to advocate for a workable buy, protect, sell program, especially one that allows for local governments, as well as land trusts, to purchase farms when valuable water rights are involved and would otherwise put these farms out of reach for the next generation. By both highlighting the need to address water and integrating it into these existing Farm Bill programs in new ways, you give us partners the ability to innovate with producers.

Water law is complex and messy, but if we hope to solve the looming issues that threaten the viability of our nation's agricultural communities, we have to be prepared to wade into the messiness and uncertainty. We cannot allow fear of complexity to snuff out good ideas or bury new tools. In the last two years, I have spoken with dozens of water managers and land trusts across the majority of western states who are interested in groundwater conservation easements as a tool they might bring to their region or community. A groundwater conservation easement is not a silver bullet, but it is another arrow in what needs to be a growing quiver to address a critical natural resource issue.

Agriculture has always been an inherently risky occupation, as much or more about love of lifestyle than certainty of returns. However, as we look at climate projections - a future filled with more drought and more volatility as to when and where precipitation will fall or how quickly our rivers will peak, it is difficult not to be pessimistic. I was the 5th generation to grow up on my family's ranch in Southeastern Arizona and many of my childhood memories were wet – throwing rocks in the creek by our house or getting stuck on the dirt road that was 30 miles between our house and school. Now my father and I have difficult conversations about how the two out of the last three years are the driest that he has ever experienced in his nearly 50 years on the ranch. The well that supplies water to my childhood home – the same home I hope to move back to in order to take over management of the ranch - is dry. And yet, my father has not given up. At 72, he is looking for new strategies, new ways to bring his management into alignment with Mother Nature. He will not give up and neither can we.

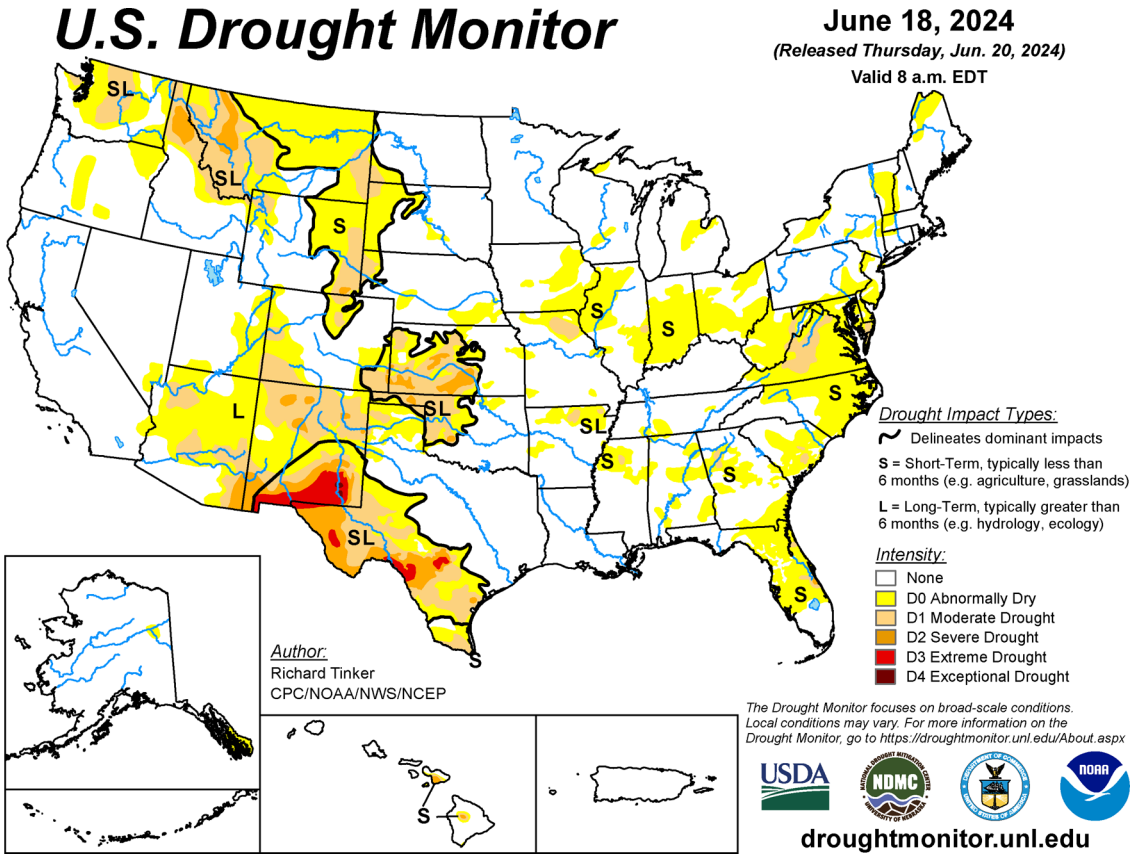
It is a comfortable thing to focus on our own areas of knowledge or expertise, to work within the black and white that make it easy for us to say no. It is easier for me as Director of Conservation of a land trust

to focus only on land development, but doing so means that I may miss the most significant threat to farm and ranch land. It is easier for a water manager to focus only on taking wells out of production, but in doing so, they may miss the unintended consequences of erosion from newly dry and barren fields and the dust that blows from those fields onto the snow of the surrounding mountain ranges. It is easier for a federal funding program to focus exclusively on fallowing as the only proof of water savings, but in doing so, we may save an aquifer, but kill communities in the process. I am continually inspired by the sacrifices of San Luis Valley farmers and ranchers to preserve their community, wildlife and the way of life they love by working toward aquifer sustainability. I would argue that more tools, including groundwater conservation easements, are needed to support San Luis Valley farmers and others across the west who want to keep farming with less water. We need to facilitate reduction with production, to keep farm communities alive while we recover aquifers.

We have only to look to Mother Nature for examples of interconnectedness of systems and we would do well to mirror this in our search for solutions. We would do well to remember that Western water challenges are not simply agricultural challenges, but challenges to wetlands and streams, challenges to wildlife, challenges to rural towns whose wells are running dry, and challenges to families trying to steward the land and survive. To remember that Western water challenges are not simply Western challenges, but challenges that produce a ripple effect across the nation as consumer prices increase when crop production decreases. I applaud the hosts of this field hearing, Senator Michael Bennet and Senator Roger Marshall, for looking beyond partisan lines to get to the heart of these challenging water issues and for asking how the next Farm Bill can support innovation to make our interconnected agricultural, ecological, and human communities more resilient.

DOCUMENTS SUBMITTED FOR THE RECORD

JUNE 26, 2024


U.S. Drought Monitor
June 18, 2024
(Released Thursday, Jun. 20, 2024)
Valid 8 a.m. EDT
Drought Impact Types:
Delineates dominant impacts
S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)
Intensity:
None
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought
Author:
Richard Tinker
CPC/NOAA/NWS/NCEP
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx
droughtmonitor.unl.edu

NATIONAL ASSOCIATION OF WHEAT GROWERS

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June 24, 2024

The Honorable Debbie Stabenow
Chairwoman
Senate Committee on Agriculture,
Nutrition, and Forestry
328A Russell Senate Office Building
Washington, D.C. 20510

The Honorable John Boozman
Ranking Member
Senate Committee on Agriculture,
Nutrition, and Forestry
328A Russell Senate Office Building
Washington, D.C. 20510

The Honorable Michael Bennet
Chair
Subcommittee on Conservation,
Climate, Forestry, and Natural Resources
261 Russell Senate Office Building
Washington, D.C. 20510

The Honorable Roger Marshall
Ranking Member
Subcommittee on Conservation,
Climate, Forestry, and Natural Resources
479A Russell Senate Office Building
Washington, D.C. 20510

Dear Chairwoman Stabenow Ranking Member Boozman, Subcommittee Chair Bennet, Ranking Member Marshall, and members of the subcommittee,

Thank you for holding this hearing to discuss ongoing drought conditions and how we can combat this devastating impact on agriculture with innovation. The National Association of Wheat Growers (NAWG) is a federation of 20 state wheat grower associations and industry partners that works to represent the needs and interests of wheat producers before Congress and federal agencies. Based in Washington, D.C., NAWG is grower-governed and works in areas as diverse as federal farm policy, transportation, trade, environmental regulation, agricultural research, and sustainability. NAWG appreciates the opportunity to provide testimony for the record expressing the concerns of wheat growers within the High Plains and Western regions. It is vital that we collectively come together to discuss innovation and methods to combat drought and maintain a strong and successful agriculture industry.

The 2024 Farm Bill reauthorization process provides an opportunity to refine existing programs to address ongoing challenges throughout the agricultural industry, and, for wheat growers, drought has remained a persistent challenge in many major wheat producing regions. Throughout the farm bill process, NAWG has underscored that protecting crop insurance is our number one priority, which is the best tool that producers have to mitigate risk – like drought – on the farm. Additionally, Congress should work to strengthen crop insurance by increasing premium support for higher levels of crop insurance coverage and improve the Supplemental Coverage Option by increasing premium support and expanding coverage. These improvements will help address concerns we have heard related to affordability and provide more timely relief than ad-hoc disaster assistance. Additionally, NAWG looks forward to working with you on conservation programs and research that can prove innovative and help mitigate drought-related impacts facing wheat growers.

The United States has recently experienced some of the driest years they have seen, and wheat growers are feeling the impacts on their cropping systems and the long-term viability of their operations. Farmers are seeing the immediate impact of the lack of moisture and the constraining effects of prolonged and sporadic periods of moisture scarcity. When drought conditions are present, it is a significant factor impacting our crops that we cannot avoid; however, properly preparing during high

moisture conditions by protecting and building soil health and utilizing innovation through practices and technologies are the greatest tools in helping maintain our lands.

Wheat requires less moisture than most other crops. As drought becomes more prevalent with climate change, and aquifers such as the Ogallala deplete, wheat will be used more extensively to maintain a cropping component on drier soils. Investment in technologies for wheat must be considered when looking to mitigate drought in the future. Winter wheat is grown on a variety of different agriculture operations because it can help maintain moisture and improve soil health by keeping the ground covered over the winter. Wheat's ability to thrive off minimal water requirements makes this an excellent crop for producers to grow while sustaining scarce nutrients and moisture. The winter wheat acts as a cover to capture any winter snow and stabilizes the soil against the hot, dry winds of the High Plains. Investing in research on new and innovative wheat germplasm is something we must consider when looking into the future.

A majority of wheat growers are using conservation tillage practices to maintain soil health and moisture content. However, the lack of tilling requires the use of herbicides to control weeds. Conservation tillage and no-till practices require the use of herbicides to treat weed pressure, but the lack of moisture makes the herbicides less effective, and many weeds have also become herbicide resistant. Simply put, producers need crop protection tools to stay in no-till systems and keep the ground covered, and the continued attacks on the use and availability of crop protection tools and the development of new tools are a concern for growers and the future of their operations. Congress and the Department of Agriculture must consider these very real situations and evaluate how programs can support growers in maintaining their no-till operations during periods of drought.

As referenced earlier, crop insurance is one of the most effective tools to protect growers during years of intense drought. However, with ever-changing conditions and drought periods worsening, there must be further improvements within the safety net. The Multi-Peril Crop Insurance (MPCI) program is one of the most invested plans in the crop insurance space. MPCI protects growers and their crops from a variety of natural disasters, and from seeding to harvesting. This type of insurance option is extremely important among agriculture producers. According to the USDA, drought and high temperatures are the leading cause of loss among crop producers in the United States.

Wheat growers are faced with planting their winter wheat in drought conditions in the fall, hoping for rain on the field before winter. Wheat growers are not typically utilizing prevented plant coverage through crop insurance, but rather planting during the drought. NAWG supports additional flexibility in prevented planting provisions which favor history of participation instead of current year planting requirements for eligibility of the Enterprise Unit structure.

NAWG is supportive of legislation (S. 2104) put forward by Chairman Bennet and Ranking Member Marshall that would allow farmers to insure wheat enterprise units by fallow and continuous, while still offering a combined option for those who it would benefit. Making the change to be able to separate the two cropping styles would be a great benefit to wheat farmers by allowing them to protect their crops and operations effectively, giving them more confidence in their business decisions. NAWG would like to thank both Chairman Bennet and Ranking Member Marshall for their efforts in introducing this piece of legislation and hope to see it included as part of a long-term farm bill later this year. With drought conditions becoming even more serious, it is vital that we give wheat growers a choice to choose between coverage options based on their practices.

Alongside crop insurance, innovation in research advancement is critical. Agribusiness investment in wheat breeding and wheat improvement in the United States is minimal compared to other

commodities. While private investment in wheat research has increased in recent years, federal investments must be made to provide solutions for problems affecting domestic wheat productivity. Wheat growers and the wheat industry depend on the USDA-Agricultural Research Services' public research efforts, checkoff programs, and land grant universities to provide these solutions. These investments have resulted in wheat varieties with an end-use quality that meets or exceeds the demands of our customers, both domestic and international. However, with drought conditions shifting along with evolving pest and disease challenges, continued investment in research is essential to help meet the long-term needs of wheat growers. Drought-resistant wheat varieties and other crops are innovative measures that will provide beneficial factors for growers and the environment. Drought-resistant crops show higher percentages of water conservation, improvements in soil health, require less maintenance, and provide higher crop yields. While wheat may be a crop that thrives in dryland, there must be further research and allocation towards testing hardier varieties of wheat to ensure efficient use of nutrients while providing higher yield numbers for growers. This advancement in research must be prioritized among all sections of the agriculture industry through funding advancements and access to new technologies.

Our nation is seeing drought periods not only worsen but extend for longer durations. The National Integrated Drought Information System suggests that with long-term droughts escalating, the damage caused to crops, ecosystems, and wildlife is becoming more catastrophic. The prolonged drought periods are resulting in decreased yields or crop failure, which is causing constraints on producers, ultimately leading to some abandoning multigeneration farming operations. Ensuring that we properly invest in programs that support our nation's food producers is something we must prioritize in this Farm Bill. Food security is national security, and it is important that this Farm Bill recognizes the continuous pressure that growers are facing in our nation. Properly allocating and increasing resources in crop insurance and research programs is a necessity in this Farm Bill reauthorization process.

NAWG appreciated the opportunity to provide written testimony for today's subcommittee hearing. Innovation to combat drought is going to be a significant feat, but it is feasible when working collectively to strengthen crop insurance, support voluntary conservation programs, maintain access to crop protection tools, and invest in research. Further collaboration and investment will be necessary for the region's long-term future.

We look forward to continuing to work with you on passing a bipartisan farm bill this year that supports wheat growers and our nation.

Thank You,

Keeff Felty
President

CAWG | COLORADO ASSOCIATION OF WHEAT GROWERS

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Dear Chairwoman Stabenow, Subcommittee Chair Bennet and other members of the committee,

Thank you for holding this special hearing to discuss combatting drought on the high plains. The Colorado Association of Wheat Growers (CAWG) is a voluntary membership organization that represents around 400 dues paying members at both the state and federal levels of government. CAWG greatly appreciates the opportunity to provide testimony for the record expressing our concern for Colorado's wheat producers.

The wheat farmers of Eastern Colorado are no stranger to drought. The last four years have proven to be an example of this, as many counties of Eastern Colorado have been in D1 to D4 drought much of this time. In fact, in 2022 Colorado saw its smallest wheat crop in 57 years due to extreme drought. While drought is unavoidable, there are ways to help mitigate its impact.

Wheat is a critical part of the crop rotation in Eastern Colorado. Wheat residue left on a field after harvest helps prevent wind erosion, captures snow, and shades the soil to preserve moisture in the cropping system. In drought years there is less wheat residue, which causes a ripple effect, leading to smaller crops with even less residue. Drought can cause an even worse impact in areas of northeastern Colorado that have infestations from the wheat stem sawfly. The wheat stem sawfly is a native pest which has modified its phenology to match with our winter wheat crop. The pest causes damage to the stems, meaning fields have to be harvested close to the ground, leaving little to no residue. In the drought of 2022, we saw this in full force, as areas that had both extreme drought conditions and wheat stem sawfly pressure experienced severe wind erosion events. For Colorado wheat farmers, managing drought and managing wheat stem sawfly are interconnected.

We have been advocating for more federal funding for wheat stem sawfly research, and appreciate the recent inclusion of wheat stem sawfly funding in the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act of 2024. Additional funding in future appropriations cycles would help even more.

The other aspect of managing drought in Colorado wheat production relates to maintaining access to crop protection tools, which are critical in no-till and minimum-tillage systems. These systems preserve moisture and have already been widely adopted. But threats to pesticide access jeopardizes continued use of these practices. In fact, as weeds have become resistant to some of our best tools, such as glyphosate, some growers are switching back to tillage. We need lower regulatory hurdles to bring new products onto the market in order to continue increasing adoption of no-till and all of the conservation benefits associated with it.

Another important factor that helps protect Colorado's wheat farmers during drought is crop insurance. Without crop insurance over the last four years, many of Colorado's wheat farmers would have been put out of business due to drought. CAWG urges lawmakers to protect and enhance crop insurance in the next farm bill, while also keeping it affordable for farmers.

Finally, voluntary conservations programs are essential to helping maintain and protect land during drought. CAWG urges lawmakers to provide a wide range of conservations options for all producers, in all climates and all regions of the country in the next Farm Bill. One program that CAWG would like to bring to lawmakers' attention is the Conservation Reserve Program (CRP). CAWG is supportive of incentivizing enrollment of marginal lands and emphasizing state partnerships, which was included in the House Committee on Agriculture's Farm, Food, and National Security Act of 2024.

CAWG appreciates the opportunity to provide written testimony on today's Hearing on the High Plains. While drought is a challenge that we will always probably face in the High Plains, its impact can be mitigated through further research and improvements to crop insurance. CAWG asks that Congress keeps Colorado's wheat farmers in mind when developing strategies to combat drought, especially in the next Farm Bill.

Thank you,

Brad Erker

Brad Erker
CAWG Executive Director

June 7, 2024

Via email to dana.ashford@usda.gov and SM.FPAC.NRCS.CLIMATE@usda.gov

Ms. Dana Ashford-Kornburger
National Climate Coordinator
U.S. Department of Agriculture
1400 Independence Ave., SW
Washington, DC 20250

Re: NRCS's Climate-Smart Agriculture and Forestry Mitigation Activities List for FY2025

Dear Ms. Dana Ashford-Kornburger,

Thank you for the opportunity to provide comments on the Natural Resource Conservation Service's (NRCS) Climate-Smart Agriculture and Forestry Mitigation Activities List. We appreciate the work that NRCS has done to fund and implement climate-smart agriculture and forestry solutions, particularly natural-climate solutions, including the protection, restoration, and enhancement of riparian and wetland ecosystems on easements and working lands**. We appreciate NRCS listing wetland restoration (code 657) and restoration of rare or declining natural communities (code 643) as "provisional" activities on the climate smart activities list, and request that NRCS move these practices to "official" climate-smart agriculture activities.** Not only do these two activities help reduce GHG emissions and sequester carbon, but they also provide other co-benefits to agricultural producers and the environment. Furthermore, we support **expanding the Irrigation Water Management practice (code 449) to include the utilization of flood irrigation to maintain functional wetland habitat.**

Restoring and Maintaining Riparian Landscapes and Wetlands Have Climate Benefits
As described in American Rivers' recent report "Restoring Western Headwater Streams with Low-Tech Process-Based Methods: A Review of the Science and Case Study Results, Challenges, and Opportunities," restoring riparian areas, floodplains and wetlands are showing opportunities for carbon sequestration and GHG emission reduction. The Second State of the Carbon Cycle Report found that "in the long-term, restoring degraded wetlands appears to be a positive for GHG mitigation."[1] The American Geophysical Union (AGU) recently released a series of reports highlighting carbon sequestration opportunities for restoring wetland and

[1] Kolka, R., C. Trettin, W. Tang, K. Krauss, S. Bansal, J. Drexler, K. Wickland, R. Chimner, D. Hogan, E. J. Pindilli, B. Benscoter, B. Tangen, E. Kane, S. Bridgham, and C. Richardson, 2018: Chapter 13: Terrestrial wetlands. In Second State of the Carbon Cycle Report (SOCCR2): A Sustained Assessment Report [Cavallaro, N., G. Shrestha, R. Birdsey, M. A. Mayes, R. G. Najjar, S. C. Reed, P. Romero-Lankao, and Z. Zhu (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 507-567, https://doi.org/10.7930/ SOCCR2.2018.Ch13.

riparian ecosystems.[2] The AGU studies found that wetland restoration may improve carbon storage by restoring the natural hydrological pattern that initially sustained the wetland and riparian ecosystem. The AGU report also found that the simplest approach to facilitating carbon sequestration within wetland ecosystems is to restore degraded wetlands, including the conversion of marginal crop and pastureland back to functional wetlands.

Studies have also found that deep flooding of degraded wetlands may help increase carbon sequestration rates.[3] Research has also found that restoring wetlands by rewetting them increases soil carbon storage.[4] Additionally, where appropriate, beaver-related restoration, which includes process-based restoration techniques that seek to re-establish natural stream processes by reconnecting incised streams with their floodplains and adjacent wetlands through the reintroduction of hand-build wood and rock structures, is an increasingly popular wetland restoration practice nationwide, along with beaver dam building, which can also improve carbon storage.[5] Overall, there appears to be evidence that wetland and riparian restoration and enhancement efforts offer potential GHG emission and carbon sequestration benefits that could be further evaluated and scaled through the implementation of IRA. Finally, in a study comparing carbon stocks in degraded floodplains to restored and reference floodplains, the author found that the majority of degraded floodplains contained lower carbon stocks than healthy functioning floodplains.[6]

Additionally, the maintenance of existing wetland habitats including flood irrigated wet meadows is crucial to support ecosystem function and preserve stored soil carbon. In the semi-arid western U.S., historic flood irrigation practices sustain significant wetland acreage located on wet meadows in riparian corridors. Continued support of flood irrigation practices in these key areas is essential to sustain this wetland footprint.

Flood irrigation of wet meadows is critical to maintaining the function of remaining wetlands. Almost half of the wetlands in closed-basin, snowmelt-driven watersheds of the western United States have been lost since 1984. Of the wetlands that remain in these basins, 61% are associated with flood irrigation of riparian wet meadows used for livestock forage[7]. Unlined irrigation ditches and water delivery infrastructure can also support groundwater recharge and the maintenance of wetland habitat. In one Colorado study, agricultural water storage, ditch seepage losses, and irrigation water application collectively were attributed to 89% of the wetlands and 92% of the total wetland area within an irrigation district[8]. In the Laramie Basin,

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[2] Wetland Carbon and Environmental Management, Geophysical Monograph 267, First Edition. Edited by Ken W. Krauss, Zhiliang Zhu, and Camille L. Stagg. (2021).

[3] Bryant, John C. and Robert H. Chabreck. "Effects of impoundment on vertical accretion of coastal marsh." *Estuaries* 21 (1998): 416-422.

[4] Lucchese, M., Waddington, J. M., Poulin, M., Pouliot, R., Rochefort, L., & Strack, M. (2010). Organic matter accumulation in a restored peatland: Evaluating restoration success. Ecological Engineering.

[5] Peter Skidmore, Joseph Wheaton, Riverscapes as natural infrastructure: Meeting challenges of climate adaptation and ecosystem restoration, Anthropocene, Volume 38, 2022.

[6] Monitoring heterogeneity and carbon sequestration of restored river-wetland corridors, Hinshaw, S., Doctoral dissertation, Colorado State University. ProQuest Publication No. 29257255 (2022). See also Dr. Ellen Wohl's research on beaver complexes carbon storage: The persistence of beaver-induced geomorphic heterogeneity and organic carbon stock in river corridors, Laurel, D. & Wohl, E., Earth Surface Processes and Landforms, (2018).

[7] Climate and human water use diminish wetland networks supporting continental waterbird migration. (Donnelly et al. 2020)

[8] The Creation and Maintenance of Wetland Ecosystems from Irrigation Canal and Reservoir Seepage in a Semi-Arid Landscape (Sueltenfuss et al. 2013)

65% of wetland inflows were derived directly from irrigation[9]. Flood irrigation practices in riparian wet meadows should be maintained; conservation strategies that intend to protect wetlands and their associated function may fall short of their intended purpose if water quantity and timing crucial to wetland function are also not retained[10].
Studies are also finding that carbon storage and greenhouse gas emission dynamics in wetlands are directly linked to water levels[11], and adjustments in water delivery have the potential to minimize harmful greenhouse gas emissions and maximize carbon benefits[12]. Further, flood irrigation practices in riparian corridors have been shown to support connectivity between riparian floodplains, groundwater, and river baseflows[13]. Lateral groundwater-river water exchange in riparian grassland systems supports elevated carbon uptake and evapotranspiration, even during dry months when carbon uptake in upland sites is constrained by water availability[14].

Restoring Wetland and Riparian Ecosystems Provide Agricultural Resilience Co-Benefits
Restoring wetland and riparian ecosystems benefit agricultural producers by enhancing drought resilience and forage availability. A 2018 study of process-based restoration projects in Colorado, Oregon, Nevada, and Idaho showed that the projects increased forage productivity and extended it longer into the year. The authors noted that increased soil moisture due to the projects enabled vegetation to keep growing well during periods of low precipitation.[15] USDA-funded research in California focusing on low-tech process-based restoration also found that restoring wetland and riparian ecosystems may enhance agricultural water security in more arid regions, with restoration practices producing "longer season duration of streamflows; slowing down and holding back water causing increased streamflows and water ponding in reaches that previously ran dry above and below dams; increased water availability." [16]

Additionally, a 2018 study by Dr. Nick Silverman utilized satellite remote sensing data to determine changes in vegetation productivity before and after three different types of riparian and floodplain reconnection projects including the floodplain reconnection using beaver dam analogs at the Oregon Bridge Creek project, grazing BMPs on Maggie Creek in Nevada, and Zeedyk structures in the Upper Gunnison Basin in Colorado.[17] The study determined that vegetation productivity increased in quantity and duration at all three study sites post restoration. The Colorado Gunnison vegetation productivity increased four years post-project by 24% and extended longer into the growing season, with October and November rates holding

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[9] The importance of flood irrigation in water supply to wetlands in the Laramie Basin, Wyoming, USA (Peck and Lovvorn 2001)
[10] Keeping wetlands wet in the western United States: adaptations to drought in agriculture-dominated human-natural systems (Downard and Endter-Wada 2013)
[11] e.g. Soil carbon and nitrogen storage in alluvial wet meadows of the Southern Sierra Nevada Mountains (Norton et al. 2014)
[12] Critical inundation level for methane emissions from wetlands (Calabrese et al. 2021); Rewetting global wetlands effectively reduces major greenhouse gas emissions (Zou et al. 2022)
[13] Hydrologic Connectivity of Head Waters and Floodplains in a Semi-Arid Watershed (Ochoa et al 2014); Hydrologic, Riparian, and Agroecosystem Functions of Traditional Acequia Irrigation Systems (Fernald et al. 2008).
[14] Groundwater-River Water Exchange Enhances Growing Season Evapotranspiration and Carbon Uptake in a Semiarid Riparian Ecosystem (Missik et al. 2019).
[15] Low-tech Riparian and Wet Meadow Restoration Increases Vegetation Productivity and Resilience Across Semi-Arid Rangelands, Silverman, N. et al., Restoration Ecology 2018.
[16] Beavers, Landowners, and Watershed Restoration: Experimenting with Beaver Dam Analogues in the Scott River Basin, California, Charnley, S. *USDA Northwest Climate Hub* (2018).
[17] Low-tech Riparian and Wet Meadow Restoration Increases Vegetation Productivity and Resilience Across Semi-arid Rangelands, Silverman, N. et al., Restoration Ecology, (2018)

the largest increases (83% and 721% respectively).[18] The authors noted another important aspect: the restoration activities at all three study sites enhanced soil water storage, which "lessens dependence of vegetation productivity on precipitation, allowing water resources and overall ecosystem function to remain intact during periods of low precipitation . . . which is particularly important in regions where drought is expected to increase in intensity, frequency, and/or duration." These types of riparian and wetland restoration practices are best practices for agricultural communities when looking to improve the overall health of their land.

Other Co-benefits of Restoring Wetland and Riparian Ecosystems
Restoring wetlands and riparian ecosystems and floodplains includes many different practices, including low-tech process-based restoration, which seeks to re-establish natural stream processes by reconnecting incised streams with their floodplains and adjacent wetlands so that more frequent inundation of the floodplain occurs. As described in American Rivers' recent report, "Restoring Western Headwater Streams with Low-Tech Process-Based Methods: A Review of the Science and Case Study Results, Challenges, and Opportunities," healthy wetland and riparian ecosystems provide a suite of benefits.[19] Studies indicate that healthy natural stream systems and restored headwater floodplains and wetlands recharge local aquifers. Reconnected floodplains enable infiltration of runoff into soils and wetlands, providing natural storage during spring runoff that can be slowly released to streams during the summer months. Healthy connected floodplains also help delay downstream flood peaks. Research also shows healthy riparian and wetland systems serve to suppress spread of fire because the soils, vegetation, and stream channels are wet throughout and thus do not readily burn.[20] Furthermore, these restored floodplains can function as a network of firebreaks, slowing the spread of fires, providing refugia for wildlife, and minimizing risks associated with certain post-fire impacts such as debris flows and sedimentation, which can clog drinking and irrigation water infrastructure and degrade water quality for communities and agriculture.

Thank you for the work NRCS is already doing to encourage climate-smart agriculture and forestry practices, and we appreciate the opportunity to provide additional feedback. Given the climate mitigation and greenhouse gas reduction benefits that floodplain and wetland restoration have, we strongly recommend NRCS move wetland restoration (code 657) and restoration of rare or declining natural communities (code 643) from "provisional" activities to "official" climate-smart agriculture activities. Furthermore, flood irrigation practices are important to maintain flood irrigated wet meadows and protect their carbon from emission. NRCS CSAF Mitigation Activities list should include Irrigation Water Management (Practice 449) where appropriate for maintaining functioning wetland habitat.

Respectfully submitted,

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American Rivers

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[18] Mesic areas are landscapes such as riparian areas, wet meadows, springs and seeps, irrigated fields, and high-elevation habitats that have a well-balanced supply of moisture throughout the growing season. Sage Grouse Initiative. Water Is Life: Introducing SGI's Sage Grouse Mesic Habitat Conservation Strategy.
[19] Restoring Western Headwater Streams with Low-Tech Process-Based Methods: A Review of the Science and Case Study Results, Challenges, and Opportunities, Corday, J. (2022). *Available at* https://www.americanrivers.org/conservation-resource/new-report-state-of-the-science-on-restoring-western-headwater-mountain-streams/.
[20] Jordan, C. E., & Fairfax, E. (2022). Beaver: The North American freshwater climate action plan. *WIREs Water*, 9(4), e1592. https://doi.org/10.1002/wat2.1592