

**Water, Under Pressure: The Uncertain Future of Colorado's Most Valuable Resource  
Episode 3: Finding Balance  
Presented by the Institute for Science & Policy at the Denver Museum of Nature &  
Science along with House of Pod**

*Sounds: Gravel crunching under feet*

**TYLER MITCHELL:** Let's pop open one of these doors, let you take a look inside. They're pretty mind-boggling.

**KRISTAN UHLENBROCK (narration):** One minute ago, I was standing in the unrelenting, afternoon sun.

*Sounds: Doors to storage facility rattle open & fans whir continuously*

**KRISTAN (narration):** Now, I'm in a hangar. It's a long half-dome structure, like where you might store an airplane.

**TYLER:** You can kinda see how it works,

**KRISTAN (narration):** I'm surrounded by a cold, damp darkness. My ears adjust first. There's the rumbling of fans. And water dripping. Then my eyes start to see what's before me; enormous mounds reaching from the floor to the ceiling.

**TYLER:** So yea, we just pile them up like that and fill this whole thing up. You know, for storing them for a long time. I mean they really look pretty good.

**KRISTAN (on scene):** That is like, a good 2, 3 pounds. How much would you say that one is?

**TYLER:** Yeah, that's a big one. That's a baker right there.

**KRISTAN (narration):** Potatoes! Piles and piles of potatoes. The San Luis Valley is the second largest potato producer in the United States, with over 90% of their potatoes ending up on dinner tables.

**KRISTAN (on scene):** Do you remember there's like a funny thing that's like there's like a jar of jelly beans on someone's desk? And they asked people to estimate how many number and the Jelly Bean. Do you make people do that? And could you give us an estimate of number of...

**TYLER:** I could not, I would have to get down with a pad and paper and do some hardcore math. But as far as individual potatoes here, but it is it is a lot.

**KRISTAN (on scene):** I mean, it has to be in the millions, right?

**KRISTAN (narration):** I'm directing my questions at Tyler Mitchell. Today, Tyler is my potato guide. But most of the time, Tyler is a commercial farmer. And He dresses the part. He wears a brown tool belt holding pliers, an adjustable wrench, and a black marker. Ready to fix whatever breaks next.

**TYLER:** I'm a third generation farmer alongside, my brother. I loved growing up here. And that's why I decided I wanted to come back and raise my family here.

**KRISTAN (narration):** Tyler lives in Monte Vista. It's one of the almost 20 towns scattered throughout the Valley.

**TYLER:** My grandpa and his brother moved here in the 40's and started farming together. And then we have our cousins across the road. We primarily grow potatoes. We used to grow some malt barley in rotation, but we've gone away from that just due to lack of water.

**KRISTAN (narration):** It might be hard to tell from Tyler's matter-of-fact tone, but as much as he proudly continues his family's farming legacy, he's also the generation that decided to make a big change. He halted their barley production. And it wasn't just any barley crop.

**TYLER:** You get to take a lot of pride for some reason, you know, growing malt barley for Coors.

**KRISTAN (narration):** Coors, as in the beer. Once, this was a badge of honor among farmers in the Valley. Every year, there was even recognition for the farmer who contributed the most barley to Coors.

**TYLER:** And I think my dad got his, like, 60-year belt buckle for our farm growing barley before we quit doing it. And so it was it was a big decision. And it was tough to, to not do anymore. But I, I feel like we made the best decision. I mean, we've gotten our farm in balance with water consumption.

**KRISTAN (narration):** When people learn that 91% of Colorado's water is used for agricultural purposes, farmers are the first to blame. But there's a lot more baked into this figure than many people realize. There are compromises that farmers like Tyler are making.

**TYLER:** Just getting people to understand that the water is not going to waste, you know, it's, it's raising a crop to put to put food on the table.

**KRISTAN (narration):** In this episode, we look at water from the lens of agriculture. And what it might cost to bring things into balance.

*Sounds: Theme Music*

*Flowing through San Luis  
Water in our veins  
The lifeblood of our culture  
Aquifers and rains*

**KRISTAN (narration):** This is Water, Under Pressure. A podcast about the increasing demands on water in Colorado. And how the choices we make now could tear us apart, or help us to navigate our uncertain future.

*Sounds: Theme music continues  
We are all Colorado  
Our future to choose  
With water on the table  
There's so much to lose*

**KRISTAN (narration):** My name is Kristan Uhlenbrock. And from the Institute for Science and Policy, this is episode three.

*Sounds: Many cows mooing*

**KRISTAN (narration):** In one of Tyler's fields, cattle are being herded. The dust floats over to where we are standing. Tyler's decided to keep some of his fields fallow, and the cattle grazing helps with restoring the soil. He walks us through rows of tractors, tillers, and trucks. There are conveyor belts, rakes, and industrial grapple claws.

**TYLER:** So how much is the whole setup? This tillage? Oh, goodness, okay, so replacement value on that right now, it'd be, the tractors pretty close to probably \$700,000 and tillage equipment behind it would be around \$100,000. So yeah,

**KRISTAN:** Almost a million dollars for the set up right here

**TYLER:** Just to till the ground. Yeah.

**KRISTAN (narration):** Farming is a business with a fickle profit and loss statement. First, there is the hefty cost of equipment. Retiring one crop for another, like barley for potatoes, isn't just about changing your mind. It's about changing significant parts of your operation. Then, there's the general uncertainty of the supply chain and food market. There are no guarantees that the price of potatoes in 2022 will be the same as it was in 2021.

**TYLER:** It's not like a manufacturer, you know, where we can manufacture a good and then and sell it for a price, it's a commodity, the price is set by supply and demand,

**KRISTAN (narration):** Then, things like COVID happen or inflation or the war in Ukraine which further strain the whole operation. And we can feel that strain on our wallets at the grocery store. On top of all of that, there's the rising cost of water.

**TYLER:** When you're deciding what crops to plant, you get a feel for what, you know, your markets gonna, gonna be and then, you know, you hope you can produce x amount, you know, how much water it's going to take in the, in the cost of the water. And that's, that's something that's new to us

**KRISTAN (narration):** The water fees are new, and they are self-imposed. Tyler is part of sub district one, there are six in the Valley. Before sub district one was formed in 2006, Tyler and other farmers didn't have to worry about the cost of water.

**TYLER:** We pump the water out of the ground and you aren't paying any, you know, you still get your electricity to pump in stuff, but, you know, the water was essentially free.

**KRISTAN (narration):** But because the system is over appropriated, the Valley had to take action. These sub districts were formed to find ways to cut use and restore balance.

**TYLER:** It started out at \$45 An acre foot and currently it's \$150 An acre foot and in the future, it's going to be up to \$500 an acre foot and that becomes a big problem... And then now that it's super dire, and you know, it's do or die, it's hard to be optimistic, if you don't have any surface water at that point, because you're essentially done, you can't, there's no crop you can afford to pay all the water at \$500 an acre foot and be profitable. So I think we'll see some guys that are gonna have to hang it up.

**KRISTAN (narration):** On top of the business pressures there are the Mother Nature and climate change pressures.

**TYLER:** If we continue down the down the drought road, we're headed, you know, I, you know, you look at some of these smaller towns in Eastern Colorado and stuff that have just kind of turned to ghost towns and that's scary to think about.

**KRISTAN (narration):** Today's water realities are grim. 10 of the past 11 years have seen below-average snowpack in the mountains surrounding the Valley. And future climate projections are only going to add pressure to the over-allocated system. Water is finite. You can't make it. You can't replace it. And unlike with renewable energy, there isn't an alternative water option. We have what we have. Our only real power is how we choose to use it. But even with all the challenges, Tyler sees farmers in the Valley doing their best.

**TYLER:** We've been doing a heck of a good job, I think the last 15 years trying to deal with the drought and I think we're only getting better at it. And so, you know, I see us plugging along and I see the valley plugging along. We just try to do the best we can and can't tell our neighbors what to do, or, but we can try and prove that it's possible I guess.

**KRISTAN (narration):** As he continues sharing his story with me, Tyler's his thoughts return to his family and the future.

**TYLER:** The plans to you know, pass it on to the next generation, you know, I'm third generation and you'd like to see it keep going. But it's it gets more and more difficult every year to even want to talk to your kids in the coming back to farming. Just with the challenges that we've had over the last decade, it's pretty stressful and can make you want to encourage your kids to do something different.

-----

**KRISTAN (narration):** Like Tyler, many people in Colorado see the challenges that farmers are facing and the ways that they are stepping up to do something about it.

**KATE GREENBERG:** My name is Kate Greenberg. I'm the Colorado Commissioner of Agriculture

**KRISTAN (narration):** I would say that Kate is not a stereotypical Ag commissioner. She's the first female and the youngest. She got her hands deep into the water issues in the Southwest while working on a restoration project aiming to reconnect the Colorado River with the Sea of Cortez in Mexico.

**KATE:** What was once a delta is now a desert. I was learning a lot about water from the tail end of the system. So that really led me into more of the policy work with young farmers and recognizing that, if you know, you want to get out there and just spend your life farming is great, but policy still determines what it looks like to be a farmer or rancher.

**KRISTAN (narration):** She eventually made it to the headwaters and switched from advocating about policy to making it.

**KATE:** We kind of keep seeing the challenges stacked up one against the next, with very little time to recover. ~~We~~, in my first year, and this has continued every year since, one of my priorities is being in the field, and listening to folks who live this work every day.

**KRISTAN (narration):** Some recurring themes in Kate's work are the pressures that farmers are under to make a living, to keep the next generation engaged, and to be at the forefront of water conservation.

**KATE:** Of course, the bottom line questions: how do you make a living in agriculture? That's always been a question in this country.

**KRISTAN (narration):** Kate can recite all the challenges, repeating many of the same ones Tyler invokes. And she puts even more weight on the effects of the drought.

**KATE:** Now we're seeing the worst conditions in over 1200 years in the Colorado Plateau, drought continues to be putting incredible pressure on producers. With drought comes pest, pressure, and then there's questions of the future, you know, how to families, support future generations, when they're already up against so much. So, you know, kind of listing all that sounds very bleak. But of course, in ag, we have a lot of resilient, dedicated, thoughtful, smart, innovative people.

**KRISTAN (narration):** To Kate, the role that farmers play in mitigating climate change is about more than just cutting back on their water usage.

**KATE:** Everybody who works in agriculture are critical to fighting climate change. Protecting the working nature of working lands, is essential to our potential for carbon sequestration, for water retention, and our soils for better soil health, which has greater potential to reduce farm inputs, potentially increase productivity, support the bottom line, again, bring in new markets. All of that ties in together with profitability as well, and our ability to keep agriculture alive and vibrant in the state.

**KRISTAN (narration):** This is where it's important to return to that stark statistic, that more than 90% of Colorado's allotted water goes to agriculture. Because according to Kate, that number needs more context.

**KATE:** Our system allows our producers to reuse water many times over so you divert more than you consume. And that diversion can be used many times. We also rely on return flows, which means once you divert water from a stream, apply it to a field to grow food. Some of that water may return, depending on the irrigation technology you're using, may return to the stream and then be used downstream as well. And that's important for how neighbors on a similar water or on the same water system rely on one another for water.

**KRISTAN (narration):** To Kate and her colleagues, farmers in the Valley are leading the way.

**KATE:** The San Luis Valley is a great example of so many of the challenges and innovations I mentioned coming together in one remarkable, beautiful ag-dependent basin. The folks in the valley are very clear about the challenges they have with their aquifer. They work very closely with Division of Water Resources on aquifer sustainability targets. They've made really tough choices. Imposed fees on themselves as water users, they're reducing pumping. They've done a remarkable effort to actually keep water in the aquifer.

**KRISTAN (narration):** Ag is important to the valley, but also to all of us.

**KATE:** we're growing food and raising food to be eaten by people. And we need to make sure that we're also helping connect healthy, great abundant food that we grow here in Colorado to people who need it. We can't lose sight of the humanity that is embedded in agriculture, that's embedded in food, that's embedded in sharing a meal with your neighbors. You can't account for that. And that is something that I think is just valued across society. No matter who you are, no matter what your beliefs are, where you come from. That is a thing that anchors us into why agriculture is so important for our state.

-----

**KRISTAN (narration):** We hear over and over how important farming culture and identity are to the Valley, to its economy, and to the legacy inherited by future generations.

But there is this tension between preservation and change. And there is a place in downtown Alamosa trying to find a balance between the two.

*Sounds: Birds chirping*

**LIZA MARRON:** So the Rio Grande Farm Park was originally a elementary school campus, 38 acres with the Rio Grande running through it."

**KRISTAN (narration):** This is Liza Marron, The Director of the Rio Grande Farm Park.

**LIZA:** And I am the steward of the San Luis Valley local foods coalition, working to create an equitable local food system in the San Luis Valley, and teaching regenerative practices on the land supporting young farmers who want to go into agriculture and elders alike and teaching people what to do with food and how to preserve it and, and how to make your own cheese ~~and I love those crafts of the land.~~

**KRISTAN (narration):** Liza is wearing a t-shirt with RWR crossed out that reads "save the aquifer." Being an activist is baked into her identity.

**LIZA:** And I feel very strongly about protecting the beauty that we have here, protecting the resources that we have here and creating systems that nourish us, in community. And that's what I stand for.

**KRISTAN (narration):** The Farm Park is a community hub providing things such as education on how to run a farm business to plots for the landless to cultivate their own small crops sustainably. Liza's passion revolves around community, food security, and stewarding the land.

**LIZA:** There's a lot of peer-to-peer learning where they're teaching each other about, mulching and composting and building living soil and aspects of running a business here in the United States because a lot of our farmers are immigrants

**KRISTAN (narration):** One of the biggest educators here is Jesus Flores, he's the farm manager. Jesus is a proud father, and next to him stands his son Brayan. Jesus gestures with his hands as he speaks, sneaking a small smile every time he looks at his son. His latest project is managing how they irrigate from the Rio Grande. And channeling water back to the river. His son, Brayan, is translating.

**JESUS FLORES (voiced by Brayan Flores):** Today, we are going to connect it to the system. We are going to do the test to see if we are at 100%. And within two weeks from now, we have to be irrigating with a drip line, because the water level of the river is dropping very fast. We have to be aware that we cannot always be irrigating when there is a drought. We have to use the system to save water and perhaps have the same crop yield.

**KRISTAN (narration):** Jesus has been a farmer since he was three years old in a town called Charcas, in Mexico.

**JESUS FLORES (voiced by Brayan Flores):** My father was a very strict man. So from a very young age, he started teaching us how to produce food. And it was great, because I'm still in my career, and I'm still producing food. It's very satisfying for him.

**KRISTAN (narration):** Brayan, Jesus' son did not have the same upbringing. He primarily grew up in Alamosa, the biggest town in the valley.

**BRAYAN FLORES:** My dad, he was always working. Always, I mean, come home tired and kind of repeat the same thing every day. So we didn't have too much of a father-son bond.

**KRISTAN (narration):** Recently, Brayan started to join Jesus on the farm.

**BRAYAN:** But now being able to come out here for the past three summers and really get to know him even more as a dad and as a person, and just really learn more about his upbringing because he was always kind of quiet about it. It's always really nice to just hear about the stories that he brings up and it's always beautiful. Like I feel very proud to be his son, and where I'm from where I come from, from a little small town in Mexico. Very, very, very, very proud.

I think the biggest thing was, like he said he started being an agriculture workers since he was three years old. To me, that's wild. Not even in my wildest dream, I could imagine that... Now seeing him hustle in how comfortable he looks doing interviews. It's wild to me and I love to see that progress in himself and just growing as a person. I love to see that."

**KRISTAN (narration):** Now, Brayan doesn't plan on becoming a farmer like his dad. He is attending Adams State University and majoring in sociology. But tending to the land

has united them. They found connection through growing food and envisioning a future in the Valley.

-----

**KRISTAN (narration):** Given all the ways in which farmers in Colorado are making sacrifices, whether it's self-imposing fees or growing different crops or changing farming practices, it seems like progress would be inevitable. But right now, the problem is still bigger than the solutions. While there are some who are making significant water cuts, the total state water usage for agriculture hasn't gone down in 17 years. There's a quote I keep stumbling across while making this show, whether in some article or even from Senator Cleave Simpson.

**BRAD UDALL:** We're right now in a place where it 19th-century water law is in a direct collision with 20th-century infrastructure and 21st-century population growth and climate change.

**KRISTAN (narration):** This is Brad Udall. Brad is a Senior Water and Climate Research Scientist for Colorado State University. He's also a former Grand Canyon river guide. A water engineer. Part of a well-known family full of western policymakers. I had to ask Brad more about what this loaded quote means. He started with the Doctrine of Prior Appropriation.

**BRAD:** And as you might imagine, given those origins of it, many of the most senior rights in the American West are associated with agriculture. More of the junior rights that now belong to our cities are subservient to those senior rights.

**KRISTAN (narration):** So 19th-century water law is colliding with 20th-century infrastructure.

**BRAD:** Like these huge dams [*Glen Canyon Dam, Hoover Dam formed the two largest reservoirs in the United States. They're enormous projects like the Colorado Big Thompson project here in this state that moves water from the Colorado Westslope to East slope, or projects like the Central Arizona Project in Arizona that move water 336 miles, and 3000 vertical feet*] all represent this infrastructure and they were built for a climate that we no longer have.

**KRISTAN (narration):** That just leaves 21st-century population growth and climate change. As Kate Greenberg mentioned, we're in the worst drought in the last 1200 years. And populations in places like Denver, Phoenix, Las Vegas, and Los Angeles have expanded by the millions in the past few decades.

**BRAD:** And all of a sudden, everything we thought we knew, it's no longer true. And I would say water, Western water law now is in a state of tremendous upheaval right now... I like to say climate change is water change and so in the American West, what

we're seeing is a whole series of things, more rain and less snow seeing earlier runoff two to six weeks earlier. We're seeing, of course, more fires as a result of less soil moisture in the summertime.

**KRISTAN (narration):** Brad brought up this concept a few times in our conversation. It's the idea of soil memory. This essentially means that the top layer of soil remembers what the conditions were like in previous seasons. During a drought – even if there is a particularly wet season – the soil is so dry that a significant portion of the runoff can't even make it into the rivers and creeks. Because the soil needs to be replenished first.

**BRAD:** Droughts are supposed to be a temporary phenomenon. And in the case of Colorado, people keep talking about this drought that started in the year 2000. Now 23 years long, it's actually becoming more and more apparent that this isn't a drought and that we're not going to return to those 20th-century conditions. And we need another term.

**KRISTAN (narration):** The term Brad uses is aridification.

**BRAD:** Aridification. Unfortunately, it's a mouthful. But it again means the long-term warming and drying of the American West. Not every year is warmer, not every year is drier. But there's a distinct trend and pattern toward these warmer and drier climate states.

**KRISTAN (narration):** Not only are new terms needed but new ways of thinking about our water cycle. The US Geological Survey just released a new map that for the first time shows how people have influenced the natural flow of water. So the problem is laid bare. The laws that govern water use in Colorado were made for different times with different conditions. And now the burden's on all of us. Historically, western water law dictated that there were winners and losers, seniors and juniors, rights and no rights. But to Brad, that way of thinking is not how we make it to the next century.

**BRAD:** The problem is not do they understand the science, the problem is how do you move to a new state, a new Western water law. And what we're finding is that this is enormously difficult. And humans, they're loss averse. It's as if people want to pretend like the old world still exists, and not take the really big steps that are needed to solve this problem. As sad and difficult as this is, the flip side right of crisis is opportunity. And so we should use this and figure out, if we're going to reset this system, let's put the environment in its proper place. Let's reset it to the maximum benefit of everybody who depends on this water.

**KRISTAN (narration):** As the pressures continue to mount, there will be pain. And that pain won't be felt evenly. But is there a new future for water that takes into account the stark reality of the situation? Where we lessen the impacts on winners and losers? Where everyone sacrifices a little and recognizes the interconnectedness of all of us – with our water, our climate, our environment, our common humanity.

I hear from farmers that they know the biggest burden falls on their shoulders. But they also say: we all need to be taking steps to solve this problem. So as Colorado approaches 6 million people with most of us living in the Front Range, are people aware of the sacrifices needed? The sacrifices to keep up with this growing demand for water? Next time we will step into that urban environment and find out.

CREDITS:

**KRISTAN (narration):** Water, Under Pressure is a production of the Institute for Science and Policy at the Denver Museum of Nature and Science, and in partnership with House of Pod.

Episodes are hosted and written by me, Kristan Uhlenbrock and producer Cat Jaffee, with the help of producer Ann Marie Awad, Nicole Delaney, and Kate Long. Our theme music is by Alex Paul of Birds of Play. Our episode composition is by Jesse Boynton with tracks from Epidemic Sounds.

For more information and additional resources on water in the San Luis Valley and greater Colorado, please visit [waterunderpressure.org](http://waterunderpressure.org). If you have learned something new from this show, please tell us and rate and review Water, Under Pressure wherever you listen to podcasts.

Thank you for subscribing and sharing the program with others. See you next time.