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Appropriations Committee November 15, 2019
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STINNER: [RECORDER MALFUNCTION] --morning and welcome to the Appropriations Committee. My name is John Stinner. I'm from Gering and I represent the 48th Legislative District. I'd like to start off by having members do self-introductions, starting with Senator Clements.

CLEMENTS: I'm Rob Clements from Elmwood, and I represent District 2: all of Cass County and part of Sarpy and Otoe.

McDONNELL: Mike McDonnell, LD5: south Omaha.

STINNER: John Stinner, Legislative District 48: all of Scotts Bluff County.

BOLZ: Senator Kate Bolz, District 29.

DORN: Senator Myron Dorn from Adams, District 30, which is all of Gage County and the southeast. fourth of Lancaster.

STINNER: We will have the other senators probably joining us with demerits given to them. They'll have to stay after, but-- assisting the committee today is Brittany Bohlmeier, Bohlmeier, our committee, clerk. Kenny Pancake will be standing in as our page. For our hearing this morning, we will have invited testimony only for those who have been invited to testify. On the cabinet to the right, you will find green testifier sheets. I would ask that you please fill one out and

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hand it to the page when you come up. If you have any handouts, please keep those until you come up to testify, and then hand them to the page. We will need 11 copies. We do not have enough copy-- if you do not have enough copies, raise your hand and the page will make additional copies for you. We will begin testimony in, on the interim study today with the introducer's opening comments. Followed [SIC] the opening statement, we will hear from the invited testifiers. We will finish with closing statements by the introducer, if they wish so. We ask that you begin your testimony by, by first giving your first name-- or your last name-- your first name and last name and spelling, for the record. As a matter of the committee policy, I'd like to remind everybody that the use of cell phones and other electronic devices are not allowed during public hearings. At this time, I would ask for all of us to silence our cell phones and make sure that they are on vibrate. With that, we will begin our hearings. Senator Bolz.

BOLZ: Thank you, Senator Stinner. My name is Kate Bolz; that's K-a-t-e B-o-l-z. I'm here to introduce LR209, which I've jointly introduced with Senator Stinner. It specifically examines water sustainability in Nebraska and, more specifically, it looks at the Daugherty Water for Food Institute [SIC] at the University of Nebraska. I first learned about this program a couple of years ago at their annual global conference. And I've become more and more of a supporter of the work that they do here in Nebraska across a number of topics related to

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water sustainability, including drought mitigation and high-productivity agriculture. Some of you know that I have a farm background. I grew up on a farm in southeast Nebraska. You may not know that one of my first jobs out of college was working for the Congressional Hunger Center, which looks at domestic and international hunger and food security, including international food production and food productivity. So this issue is pretty close to my heart. More than that, water sustainability is one of our most urgent global issues. Nebraska, with our diverse ecological climate zones and direct reliance on the water sustainability for agriculture, is the perfect place for cutting-edge research being done at the Water for Food Institute. We have invited testimony today about how this research impacts our state, starting with the University of Nebraska Chancellor Ronnie Green, Water for Food Institute executive director Peter McCornick, ag producer Roric Paulman, and my friend North Platte NRD general manager John Berge. So I'm going to keep it short. If you have any questions for me, I'm happy to answer them, but there are several experts here who can walk you through the specifics of Water for Food.

STINNER: Any questions? Seeing none, thank you.

BOLZ: Thank you.

STINNER: Good morning, Chancellor Green.

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RONNIE GREEN: Good morning. Good morning, Chairman Stinner and members of the committee. It's an honor to be here. My name is Ronnie Green, R-o-n-n-i-e G-r-e-e-n, and I'm the chancellor of the University of Nebraska at Lincoln. Loren Eiseley, one of our state's most famous writers, known as the modern day Thoreau, and a UNL alumni [SIC], said, "If there is magic on this planet, it is contained in water." Nebraska is blessed with an abundant wealth of natural resources, and none are more valuable than our water. Nebraska's farmlands and native grasslands comprise one of the most productive agroecosystems in the world. But it is our wealth of water resources, including nearly 80,000 miles of rivers and streams and the 3.25 billion acre-feet of water in the High Plains aquifer, one of the largest underground aquifers in the world, that-- it truly sets us apart. These water resources enable our highly intensive irrigated crop production, placing Nebraska first in the U.S. in irrigated acres-- over 9.3 million of the approximately 22 million acres of cropland in our state-- and third in total agricultural production with over \$21 million in cash receipts, making us a globally significant food producer, indeed, what I refer to often as the epicenter of red meat, corn, soybeans, ethanol, sugar beets, northern beans and more. What also distinguishes Nebraska is that, even as we irrigate so many acres and have some areas where the aquifer is somewhat depleted, in large areas groundwater levels have risen since the first recordings by the UNL Conservation and Survey Division in the 1950s. In fact, it is

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estimated that if the Ogallala Aquifer groundwater was poured over our entire state, the depth would be almost 38 feet in magnitude. This is in large part due to our statewide dedication to conserving and managing our precious water and other natural resources. Nebraska has always been a progressive state, and, thanks to legislators like yourselves and your predecessors, we are leaders in adopting innovative policies to manage and conserve surface and groundwater resources. One of the greatest examples is our natural resources district system, which is unique in the U.S. And throughout the world. Nebraska's 23 NRDs are based on river basin boundaries, enabling management of our water on a watershed basis. Each is autonomous, governed by a locally elected board of directors, and able to set its own priorities and develop programs that best serve local needs. And all of them work hand-in-hand with the University and depend on data generated by our world-leading scientists, since they were first enacted in 1972. As you know, this year is the 150th anniversary of the founding of the University of Nebraska, as a land grant university to spur education and innovation in agriculture and the mechanical arts, engineering, and military sciences, a mission we have never wavered from over the past 15 decades. And since the beginning, UNL has been a leader in research on water, agriculture, and the management of critical natural resources. When Nebraska luminary Charles Bessey, who was on our faculty, eventually formed the American Association for the Advancement of Science and Science Magazine, he

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would be-- when he first became a botany professor with us in 1884, he emphasized experimentation and science through practice. In 1887, he helped write the federal Hatch Act that provided each state with \$15,000 in annual federal funding to support experiment stations at land grant universities like Nebraska. Soon after, Nebraska's Legislature matched the federal funding. That same year, irrigation in Nebraska was the first bulletin produced by the Nebraska Agricultural Experiment Station. Federal and state funding has been essential to research ever since. From that original \$30,000 of funding in 1887, our research enterprise at UNL has grown 10,000-fold to over \$320 million in annual research expenditures this past fiscal year, with 48 percent of that generated by UNL's world-leading Institute of Agriculture and Natural Resources. Throughout our university's phenomenal growth and research, we've never lost sight of the life-sustaining importance of water for Nebraska and the world. In 2008, four visionary native Nebraskans-- Bob Daugherty, the founder of Valmont Industries, J.B. Milliken, Harvey Perlman, and Jeff Raikes-- decided our university would commit to making an impact on one of the greatest challenges facing the global community: how to grow more food using less water. The Daugherty Water for Food Global Institute was founded on this vision, and it was backed by the \$11.8 million in faculty hires, equipment, and other resources. We were able to invest in the year, the years between 2003 and 2010, some of which are highlighted in the attached attachment that you received this morning.

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The Nebraska Water Center was established by Congressional mandate, as one of 54 Water Resources Research Institutes, in 1964. It has been a major contributor to UNL's strength in water research, teaching, extension, and outreach, and is now a critical part of the Daugherty Water for Food Global Institute. From 2003 to 2010, UNL invested \$4.5 million to support programing, staff, and cutting-edge equipment for the Water Sciences Laboratory, which provides analysis services to state, federal, and private entities. With these investments, the Water Sciences Lab has become one of the top analytical water labs in the nation. The Water Resources Research Initiative grew out of a statewide listening tour conducted by IANR in 2001, where we heard that water quality and quantity topped the list of constituents' concerns. In response in 2003, UNL funded the WRRI. It brought together researchers from many disciplines to explore key water issues, develop tools to guide decision making, and to test possible solutions to the challenges of managing both water quantity and quality. From 2003 to 2010, we invested \$5.7 million in WRRI, from UNL Program [SIC] of Excellence funds, the Nebraska Research Initiative of the overall University, and the University Foundation. In 2006, our Congressional delegation directed \$525,000 in federal appropriations to help us develop a water resources model for the western Platte River and to purchase critical equipment for the Water Sciences Laboratory mentioned earlier. And in 2003-'04, the NU [SIC] Foundation provided \$140,000 to establish an innovative drip irrigation research

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and demonstration site at our West Central Research and Extension Center in North Platte. These timely and strategic investments grew our strength and breadth not only in water research, but in collaborative work focused on the intersection of food and water issues. The return on our investment will significantly increase external funding in these critical areas. An early success was a \$2 million dollar project funded by the Bill and Melinda Gates Foundation in 2011, to establish the Global Yield Gap and Water Productivity Atlas led by UNL agronomists Ken Cassman and Patricio Grassini. Today this project does yield gap analysis and related research by funding agencies ranging from the Nebraska Soybean Board to the Norwegian Ministry of Foreign Affairs, covering 55 countries in their work and all major cereal crops. And they have received more than \$8 million in current external grants. Another success is the five-year \$3.9 million project, funded by the National Science Foundation in 2009, on resilience and adaptive governance in stressed watersheds. These in, this innovative project focused, in this case, on the Platte River Basin, trained 26 doctoral students across different disciplines. The lead investigator, Craig Allen, went on to win another similar \$2.9 million NSF award in 2017, that is training 25 more Ph.Ds, focused on resilience in ag and water systems. These students are the future leaders who will manage and conserve our food and water systems. And just last week, UNL scientists and partners from our Big Ten partner, the University of Illinois, and Princeton University, won a \$900,000

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USDA NIFA grant for a project that aims to bridge the gap between data collection, modeling, and decision-making, to help crop producers decide when and where and what to irrigate. I have no doubt that Bob Daugherty, who made his life's work to improve irrigation by first taking innovation out of the University of Nebraska, the center pivot, to improve irrigation, that he left a legacy-- huge legacy of innovation to feed a growing world. I think Bob would like this project and many of the others that are occurring across the institution. And while this history of innovation and stewardship of water resources and management, enabled by the University of Nebraska, have been pivotally really important, there exists the critical need, at the current time, to increase the investment in this area for the state of Nebraska, as we move forward for a sustainable future. Thank you, and I'd be happy to address any questions.

STINNER: Questions? Seeing none, thank you.

RONNIE GREEN: Thank you.

STINNER: Good morning.

PETER McCORNICK: Good Morning. Good morning, Chairman Stinner and members of the Appropriations Committee. My name is Peter McCornick; that's Peter M-c-C-o-r-n-i-c-k-- that's "N" for Nebraska, not "M." I am the executive director of the Daugherty Water for Food Global Institute at the University of Nebraska. [ALARM]

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STINNER: Sorry about that.

WISHART: Does that always happen after you introduce yourself?

PETER McCORNICK: Yeah, it seems to. It didn't like my joke.

_____ : May I have your attention, please? May I have your attention, please? There has been a fire alarm reported in the building. There has been a fire alarm reported in the building. Please proceed to the stairways and exit the building. Do not use the elevators, but proceed to the stairways and exit the building [ALARM].

DORN: Is this a testing or is this the real thing?

VARGAS: It's not [INAUDIBLE]. Do we go home or is it a test?

McDONNELL: I say we play it out, boss. I say we keep going, but [INAUDIBLE]. This is-- I'll push you guys down-- save yourself.

_____ : May I have your attention, please? May I have your attention please? There has been a fire alarm--

DORN: Oops, they shut her off.

STINNER: I think we're safe to proceed-- I hope.

PETER McCORNICK: Will I go on?

STINNER: Please.

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VARGAS: It's all good.

PETER McCORNICK: Thank you for the opportunity to share a bit about the work and impact of the Daugherty Institute. And thank you, Senator Bolz, for bringing forward this interim study on a topic that has significant implications for the success and well-being of our state. You've heard Chancellor Green talk about the University's rich 150-year history of research and outreach in water, agricultural, and natural resources. DWFI, created in 2010, has existed for only a fraction of that time.

_____ : May I have your attention, please? May I have your attention, please? The fire alarm is a false alarm, false alarm. All clear, all clear.

PETER McCORNICK: OK. The institute was created in 2010, which is only a fraction of the time that the University has been focused on this topic. But our work, over the past 10 years, in leveraging the experience of all four University of Nebraska campuses to improve water management in agricultural and food systems is, I believe, a true success story for our state. And the greatest opportunities still lie ahead. As Chancellor Green mentioned, we were established with a gift from the Robert B. Doherty Foundation, named in honor of the founder, the founder of Valmont Industries. [ALARM].

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_____ : [ALARM] May I have your attention, please? May I have your attention, please? There has been a fire amount reported in the building. There has been a fair amount reported in the--

STINNER: This must be your lucky day.

PETER McCORNICK: It is, apparently.

VARGAS: Some kids are pulling fire alarms. No, just kidding.

STINNER: I'd proceed.

PETER McCORNICK: Yes.

STINNER: Let's see what we can get done before the next one goes.

PETER McCORNICK: We were established with a gift from the Robert B. Daugherty Foundation. And Bob Daugherty's choice to invest in the University of Nebraska was no accident. He selected Nebraska because of our well-established expertise in water and agricultural research, and the state's renowned strengths in agriculture and natural resources management. He understood a critical formula for excellence: Invest in your strengths, and you can become even stronger. He believed, as we do, that there's no place better suited to lead the way in achieving water and food security for the growing global population than Nebraska. The stakes for our work could not be higher, more complex--

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_____ : May I have your attention, please? May I have your attention? The [INAUDIBLE] fire alarm is a false alarm. All clear, all clear.

PETER McCORNICK: The stakes for our work could not be higher, more complex or more urgent. Every night, almost one billion people around the world still go to bed hungry. Many of these people are also very water insecure, lacking access to enough clean water for drinking and for productive purposes. By 2050, our global food production will need to almost double, and the types of products we need to produce will need to be more diverse in order to feed almost 10 billion people. This is a matter of quality of life for our fellow human beings, as well as an international, matter of international security. Water scarcity creates conflict. If we are to achieve worldwide water and food security, we must develop new strategies for managing our precious, precious water resources to meet our food needs. Closer to home, this year's devastating floods across Nebraska are a powerful reminder of the importance of effective water management, especially in the face of unpredictable climate. We collaborate across the University of Nebraska system, as well, as well with farmers, ranchers, public and private partners to inform, advise and initiate change. We work with interdisciplinary faculty who are involved in cutting-edge science and policy research. Recognizing the University's vital role in work force development, we are preparing the next

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generation of water and food leaders, having directly invested with more than \$30 million in graduate student support here in Nebraska-- \$33 million. I'd like to share with you a few examples of our work. In short, you can be proud of what the University-- your university has become a world leader in addressing one of the most urgent challenges of our time. Nebraska does not simply have a seat at the table in this conversation now; we are at the head of the table. The issues we tackle on a daily basis include: We support technology development to reduce risk and making farming operations more efficient and competitive. This includes decision support, tools to improve water management and food production, like soil moisture, sensors in the field, data collection from drones, and other strategies that provide farmers with accurate, real-time information to guide their irrigation and agricultural decisions. We work on ensuring safe, clean water, as it's important to all Nebraskans, from irrigation to the water pouring from our faucets in households and businesses across the state. DWFII is working to better understand the water quality conditions and the links with, with public health, reduce potential for contamination, and support water utilities and farmers in addressing these issues. We produce, we need to produce more and different foods with less water stress. For example, we recently published the Nebraska Water Productivity Report that's just come out a month ago-- and good planning-- that reflects remarkable improvements in the state and yield per drop of water used for crop, livestock, and biofuels over

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the past three decades. This is quite remarkable. I was quite surprised by this. Going forward, our challenge is to sustain this level of improvement for a wider range of products. Continue to improve groundwater management is also one of the key areas, going forward. We work on this to ensure the quality and quantity of our natural resources will sustain our community, agricultural and natural ecosystems for the for future generations. Located on the Nebraska Innovation Campus, we work side-by-side with entrepreneurs in the water and agricultural space, helping them test new equipment and conduct market research for start-ups. We also provide hands-on training for students, interns, and staff in building innovative, scalable agricultural companies. These young professionals can then move into high-paying industry positions or launch their own companies, building a network of connections and growing Nebraska's work force. Nebraska is leading the way in agriculture, in agricultural productivity and responsible stewardship of water resources. Your partnership and support have been critical to our success, and we are grateful for, for your ongoing engagement, Mr. Chairman, in addition to our most recent annual report and the Nebraska Water Productivity Report, I have also provided the committee a copy of the testimony for Brandon Hunnicutt, a farmer from Giltner, who describes this experience with the Daugherty Water for Food Global Institute. Unfortunately, he could not be here today because of the

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demands of this extended harvest period that keeps him on the farm. I would be pleased to answer any questions.

STINNER: Any questions? Let me ask you. As far as the Institute is concerned, is-- the university approaches you with ideas that they need to have funding? Or is it you that approaches the University with [INAUDIBLE]?

PETER McCORNICK: It's both. I mean, essentially, we have some resource-- we have resources that we work with our faculty. So we have over 120, or close to 120, faculty who work directly with us in one capacity or another. And so we collaborate with them on, on-- both on the research design. We also help in convening. We convene directly, so we have an annual conference every year that's our flagship activity.

STINNER: Right.

PETER McCORNICK: But we also have the Nebraska Water Conference, and we get ideas both from the faculty and from the, from our broader community of partners across the state, to look at what our priorities should be in research. We put some support then, but also, for instance, with our, our graduate student support program, we ask them to match. We provide resources for the graduate students. We ask the faculty members to find the match from, from other parts of the funding environment in the University.

STINNER: Our NRDs are tasked with water sustainability and, obviously in my district, they've been tasked with restoring water flows back to the river. There's a, there's a management program that they put together, a water management program. Have you, have you looked at that, inspected that? Is that adequate? Is it accurate? Do you have an opinion on that? And do you interface with the, with the Nebraska NRDs?

PETER McCORNICK: Yes, quite, quite a lot. John is behind me, and we work with John quite a bit, and others across the state. We are actively involved with, with the NRDs, both at the individual NRDs and, and at the, the state level. I assume you mean the Platte River Recovery Program [SIC]? I, it's--

STINNER: Right.

PETER McCORNICK: Yes. For me, that's actually one of the other stories that-- the groundwater story and the uniqueness of the groundwater management system in Nebraska, it's, it's extraordinary. And this is something that it's important to highlight, because quite easily, if you look at this from beyond the boundaries of the state, we hear all about the Ogallala as being a disaster. And actually in Nebraska, it's, it's a very positive case. Also with the Platte River, I mean, in terms of how this is being managed and what is being done, it's, it's costing a lot. One of the lessons from all of this, it's easier

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to do this beforehand and trying to reverse it, than trying to reverse it. But if you're trying to reverse this and restore the ecosystem, this is a model that has actually been very-- it's being very successful. There's still some challenges ahead, but certainly it's, it's, again, something I think in Nebraska we should be quite proud of it, in how it's going forward, realizing it's, it's contentious and it has its, it has its challenges, but it's, it's an area that I think is very unique, again, for Nebraska.

STINNER: The only other question I have is, annually, how much do you contribute to the University per the graduate assistants-- tuition, research, those types of things?

PETER McCORNICK: Our total budget is around \$10 million, in terms of our direct budget with--

STINNER: OK.

PETER McCORNICK: It, it's basically-- not quite-- it's almost a third that comes from the gift from, from the Daugherty Foundation. A third comes from a match from the University. And it's not quite at a third yet, but it's basically the grants coming from, from our, our team and, and our-- so we bring in another third. And so from that environment, we-- in terms of the contribute, contribution to the University, that's-- it's a significant part of that.

STINNER: Very good; thank you. Any additional questions? Senator Dorn.

DORN: Thank you. Thank you for being here. I guess this relates a little bit to the issues we had this spring. Has that, has that challenged you? Or is that-- your group, your organization here, has that redirected any thinking? Or I guess how is that-- has that-- what kind of impact or anything?

PETER McCORNICK: That's a good question because, when I came here three years ago, one of the areas I lift, I raised as a potential area we should be thinking about in our strategies: floods. But at that time there wasn't a lot of emphasis on floods. And of course, it shifted very quickly in the spring. So we did get pulled into-- and we did get involved. I think there's lots of different folks were involved. And the University, the decision-- we went forward with Extension taking the lead on this, and we have people who are directly linked into Extension, so we were very much involved with the, the recovery part and providing information, providing the, the-- providing partners from everything, from some of the infrastructure, infrastructure questions to some of the public health, the mental health issues and providing information as, as we could. There was a lot of players in that, that certainly trying to then create our own league, league was, was really not appropriate during that, that period. It was just be a good team player and provide what we could into the process. We are now engaging more in some of the discussions

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around what to do, and particularly, one of the areas is around how do we, how do we come out of this better and stronger because, from afar-- and I've been in situations where large, devastating floods have caused major problems. And, and it's-- one of the things that really struck me is how resilient or just how many players got involved. And I realize that still many farmers and NRDs are still working with many of the challenges of this. But the federal government, the state government --who got involved and how that all got, got addressed. But there's-- what are the lessons learned? What are the things we can do to be more resilient? And this can be many things, from a field level up to farms and, and NRDs. We again-- we're, we're more a part of a team on this. And, and-- but we help convene, we help bring people together, and, as we're going forward, we see us doing more of that in a, on this particular topic.

DORN: Thank you.

STINNER: Very good. Additional questions? Seeing none, thank you.

PETER McCORNICK: Thank you very much.

RORIC PAULMAN: Good morning.

STINNER: Good morning.

RORIC PAULMAN: Started at 5:00 this morning. Roric Paulman,

P-a-u-l-m-a-n, R-o-r-i-c. I am a ag producer from southwest Nebraska.

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I'm in the 42nd District. We farm about 10,000 acres, of which 80 percent of it is groundwater, irrigated; 20 percent is rain fed. I'm in the Upper Republican, the Middle Republican, and the Twin Platte NRD. I've been a part of integrated management planning, which you alluded to, Chairman Stinner, earlier, that since day one, on the Platte, as well-- the Upper Basin, as well as our local NRDs. And I've also been a part of the Republican Basin sustainability process. I helped cochair LB1098, Senator Carlson's bill to put together the Water Sustainability Fund. I spent nearly a year because I believe in the process. I believe in the investment, not only in agriculture, but also in our municipal water supply, our reliability of not only quantity, but quality. So along those ways, I decided to put my money where my mouth spoke often, and put my farm into a demonstration project that, that reached out to technology, reached out to process, reached out to the University of Nebraska, and all of these outside providers that had looked at digital imagery to real-time soil testing, to understanding what is happening in your fields at real time. And there wasn't a lot of adoption. There wasn't a lot of producers that were willing to A: to spend the money or the time to figure out how do you integrate this into a better decision tool at the farm level. It's difficult because it's it's not cheap and it takes time. And there's a level of trust about that data, about whether that will make you a better producer. It will-- you will do a better job with the natural resources that are presented to you. And

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so over that time period, I helped start a group called the Nebraska Water Balance Alliance. And essentially, what we did is just became a host place so that these people, so the IBMs, the Phytechs, the Valmont Industries, others that had new ideas and processes, could come in and we could talk about them. And how do we look at it? How does that work on our farm? And help them kind of steer the path of, of mistakes or adoption, and bring these innovative ideas quickly-- or more quickly-- into the, into the farmers' hands. Well, then the drought comes. Then, then NPPD comes to me. I live right next to Gerald Gentleman Station. I live underneath those smokestacks. And they come with the, you know, the largest commercial well field to be drilled in the state of Nebraska. And I had to ask them some questions. And at the time, the CEO, Bill Fehrman, and I spent a lot of time together and we developed an integrated management plan with, with the power plant, and it was for them to pump water and, and ask us, as producers around there, to not pump, so that there was a million homes that were provided electricity from this plant. And we would-- and, and And I had to ask the question. I said, "Well, why would I want to quit farming so that somebody can have their air conditioner run?" And I was serious about that. And there was a lot of other producers in the same way. So we had to figure out how to operate, and that led to telemetry on pivots. It led to real-time grid sampling, to all kinds of technologies that exist today. But what we didn't have was, was that trusted partner that could, that could take

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and evaluate and actually do the research, actually say: hey, hey, producer; hey, inventory-- or hey, vendor; hey, OEM; this, this process really does make sense. And, and so we spent that time with the University of Nebraska, working with West Central, with Dr. Irmak, and then kind of that progression of his students. And and that's built in to a long and great relationship and growth of ideas. And that's, that's what Nebraskans are; we're innovators, we're, we're adopters of that process. So we have, we have today a lot of things. We have a lot of success stories. And one in particular that comes to mind is-- it's called the TAPS project. It's called Testing Ag Performance Solutions. We actually started that out in the, on the farm, but we now have done a partnership with West Central Research and Extension and, obviously, all the way to Lincoln. But that process takes that same idea, but it develops a peer network. It finds young men and women and champions that will talk about and and move the needle. And those, and those, those producers are from all over. In the first year, we, we pretty much stuck to the state. Then we started expanding. So we're-- now we have Kansas involved in it. We have Oklahoma involved in it. I'm actually competing in Oklahoma, outside of, of, of trying to bring these kind of levels of adoptions, relationships, partnerships. And what, what helps us? How do we, how do we, how do we move that needle? And without, without the University of Nebraska, without Daugherty, without all of these interests, that conversation continues to expand. It's about a network. How do you,

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how do you, how do you bring them back in, bring their ideas and processes back to a producer that has a level of trust, that they actually will change their behavior, that they actually will, will make better decisions? 'Cause a producer will not do that. They're, they're, they're an independent businessman, as many of us are around this table. And and those are choices that they have to make. So it has to have an ROI. It has to make sense that, that they can integrate that. And not all, not always do Natural Resources set that priority. So irrigation, in itself, has transformed where I live. I live in a place where there's only 18 inches of rainfall, so I have to supplement natural precip, precipitation with irrigation. And my, my decisions today, I use half the water that I did 10 years ago-- one-half-- and I, I, I've been under allocation in the Middle and the Upper Republican. This is my 34th crop year. And so we have, you know, been under allocation. And we still meet and exceed those expectations, what they call hard caps now in that, in that process with Kansas and Colorado. Again on the Platte, I've been a part of-- I've seen five NDNR directors go since Roger Patterson and Ann Bleed and, and Brian Dunnigan and today with Jeff Fassett. I mean, I've, I've been through all of those conversations with not only groundwater, but surface water. And it always hasn't been a great conversation. But the University of Nebraska has always been that that common denominator, that place where you have to have them on board, you have to have that discussion, you have to have those people, those

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researchers, those extension talking the same language. And we didn't always do that really well. But it's, it was as much on us as producers as it was in what, what is that common language, what is that common denominator. We have a, we have a really great future, but it is still not going to be without pain. It is still not going to be without some difficulty. And without that trusted partnership, without that process, it's going to be very, very difficult. The investment that it's going to take in water and land in Nebraska, that is a core part of what we do. It's not going to change. It's not going away. So my-- and I'm not going to go away. I'm going to-- I am fortunate. I'm third generation, I got the fourth generation on the farm. He's at home today in the combine. He's texted me about 30 times. But I unloaded the last truck at 11:00 last night, and he says: Do we need to change bins? And I said: Well, didn't you look on your phone? Because we have an app that actually keeps inventories in our bins as we fill them in real time. And he goes: Dad, how, how do you remember that stuff? And I said: Well, I said, you get a few more years, you'll be all right. You can, you can manage all those and juggle all those balls. Water is the cornerstone of our operation. It builds my balance sheet; it's significant. And what is in front of us is, is amazing. I am going to host a couple of meetings here over the winter. There is an Israeli company that is, is-- got an interesting concept about measuring the plant growth during the season. And they brought us this great app that shows it. And I said: So who, who did the science on

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this? Who, who has validated that? Have you reached out anywhere else?

And I mean, it comes from Israel. So obviously, there hadn't been that handshake yet with UNL. And so we're going to, we're going to make those connections. And, and I believe over time, as, as more and more these ways that can help make better decisions for producers, it has to be a cornerstone that, that UNL Daugherty Water for Food has to be a part of that. Thank you.

STINNER: Questions. Senator Wishart.

WISHART: Thank you so much for being here. Every time I meet you, I'm more and more impressed. And I actually had the opportunity to go up and visit your farm, when I was a staff member at the Unicameral years ago, and meet with all the technology companies that you partner with. And it's really exciting. You mentioned, earlier on in your testimony, that you're kind of on the cutting edge as a producer, in terms of embracing new technologies. Since you've started doing that, have you seen more producers come on line with embracing, similar to you, sort of contemporary technologies to help reduce their water use?

RORIC PAULMAN: Absolutely. But I'm going to, I'm also going to be fair to the industry that, that until recently, there hasn't been enough support to move that adoption needle beyond about 10 or 20 percent. And part of that-- there, there's two parts to that. It is A) The, the research and delivery of that message have been lagging, and, and the

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investment that ,that the, that the OEMs and vendors have done is they've kind of, they've been very selective about where they've gone with those processes. So those investments haven't, haven't stuck around long enough to really be utilized by a producer. And so you make an investment in technology-- I have a whole building full of technology that, that has cost a lot of money, that a lot of producers are less, less, I guess, agreeable to, to utilize. What has happened in the last two or three years has changed that, is developing this peer network, the University taking on, in one instance, the TAPS project. I know that there are other water projects that obviously have gotten significant press, that, that have-- you have to ask yourself if, if we would have had a better, or a, or a process that would have put this all together all the time, would we not be in a better place? And that's where I see the needle is now, is we are, is that there's, there's enough adoption. There's enough integration. There is enough from, from it. And that just brought to light one other thing. I spent a lot of time with IBM here recently. They released a tool called the Watson Decision Platform for Agriculture. And they own the Weather Underground, which I think, you know, everybody has their favorite weather app. But what I didn't know was that, that they started picking out, or they' were able to integrate all these weather stations. One of the challenges as an irrigator, obviously, is when to start and when to stop, two hard, the two hardest decisions they have, you know, and keeping it running one,

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once it is running. But the two hardest are when to start and when to stop. And evapotranspiration, and understanding the soil moisture, and predictive weather is huge. Well, we already have-- we have the drought center right here in Nebraska. And, and now, now all at once, all these, these weather stations are coming on board, and, and they're giving us predictions, three and four and five days out. Well, if you can wait and possibly have that irrigation postponed, and you can actually take in that rain event, then, wow. I mean, that's not only economically,-- you're not spending the energy, you don't have to turn a wind turbine. I mean, there's all kinds of things that go all the way up the ladder when you get into those situations. That tool is going to be available very quickly. The Twin Platte NRD, another good example, and John will speak to some of his, as well, too, is, is, you know, better data. But what do you do with it? And it's in so many different silos, even within our own county. How do you access that and then turn that into a better decision tool? Well, it exists, but how do you make those connections? And the vehicle is, is UNL. It-- there is no doubt of how to make those connections. So a long, very long answer to it.

WISHART: Well, it kind of leads into the, to the second part of my question, And I-- you answered it a little bit in the sense that we've seen, over the last two or three years, that there are more people coming on line and embracing these technologies. What is it that we

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can do, at a legislative level, to help incentivize more producers embracing technology the way you have?

RORIC PAULMAN: Well, it is going to lay it right out there. It, that is, you know-- in a partnership, to get a producer to trust that, that conversation, that relationship, that, that's the gap that it takes. And that takes time. And, and not every producer is ready for the full gamut. And, and the mistake that we've made, I believe, is we've jumped to the end, as opposed to laying out a process that, that makes small and incremental changes. But we see these numbers up here that, that we can save two or three or four inches of pumping and still have an economic return, or an ROI. That wasn't the conversation so very long ago, either; it was "more crop per drop," you know. How is that, that we can sustain, and make, and keep producers profitable? Whether it's on grasslands or whether it's on row crop, it doesn't matter. So in that conversation, to be able to do that, revamping how we see and how we interact with those producers has had a significant change. That's, that's why the TAPS project I'm really excited about is, all at once, we've gone from a dozen peers to 60, to 80. I'll take the Nebraska LEAD program-- I'm a LEAD-7 alum-- same thing is it's taken over time to make that network large enough that it's OK getting young producers. Most of the time. It's people my age that have the money to invest in that, in that process. And young producers are looking at appeared at a P&L that doesn't allow them to make that kind of

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investment. So is there ways that we can look at and partner with those people? Yes, absolutely. Is that through Nebraska extension? Is that through workshops with the vendors and OEMs themselves? Absolutely. And they recognize that as well, too, because they got to that 10 or 15 percent adoption level. And, and it, and it just kind of died right there. Well, they're not going to spend millions of dollars to put more into a weather tool if, if, if they don't get adoption. So what we what we did within UNL to do that is, is integrate that into that conversation and start to look at it. It's going to take time it-- just for it to happen overnight. So legislatively, the short answer to that is, is, is to continue to support and figure out innovative ways that we can insert, insert the, the Legislature into that process and, and be a part of those conversations in a very positive way. And I think you've done that. And-- but what are the next steps? Because we're not going to continue to do things as we've always done-- this is no longer my grandfather's farm. It is, it is so intuitive, so connected, so-- I have 40 apps on my phone that I run my farm with. And I can, I can look right now, today, where Zach is in the field, I can look at how much yield, I can see how fast he is going. I can look at the efficiency of that combine in real time. And those young producers are, are doing the same thing. So it's a whole different conversation in how we connect with them and what those op, how those opportunities lie. And so what you're doing with this, and,

and I believe your jump-starting the conversation to do just that, is how do we how do we move that needle.

WISHART: I have one more question. So we've-- at least in Lincoln, we've seen in the Journal Star some articles about rural broadband and access to world technology. From your perspective, even if we had a significant increase in producers who wanted to, to adopt this kind of technology, do we, as a state, have the infrastructure, the technological bandwidth to allow them to be as modern as possible?

RORIC PAULMAN: No. Currently, I spend about \$22 an acre. I've been quoted and misquoted about what that is, but those are fees. So every device today that I connect has-- generally has either a cell phone connection SIM card or it has a cellular-- or a satellite connection, and so every pivot, between \$200 and \$300 dollars in telemetry fees. That's unlimited access-- or not unlimited-- it gives you so many calls. If it breaks down or you start to stop it, I mean, there, there are some restrictions there, but I recent-- I-- that's a, that's a pet peeve of mine-- is telecom, is, is, I paid to have fiber into my own farm to grow that network. And I worked with several other lower-end network providers to figure out how do we, how do we do this efficiently, because that, that is the, that is the restriction today, is how do we get, how do we get that data and get it in a, in a affordable packet, because the, the tools themselves-- but the industry has come a long ways, too. So those, those continue to go

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down, but you get more data out of them, more pieces of the puzzle coming as a result of those connections. So the value that they're bringing to us, it's starting to get pretty close to a balance. But now it's regional, so I extend down into Perkins. Keith, Hayes, Lincoln Counties. And there is a significant area there-- south-- that it's dead area. So we have to use-- we either have to connect to a landline or use some type of satellite connection to do that. Those are, those are very expensive. But the data now is, is becoming viable enough. Just like I said, through my, through what I, what I access, from a profitability standpoint, I need to know. I want to know in real time. That is a significant restriction in the expansion of these technologies because it's a significant amount of their cost. It's every year. It doesn't go down. I mean, it's those providers, those cell providers are continuing that, that same feat. They have us on the hook. I mean, we have-- where else you going to go? I mean, there is, there's nothing else,. there's not another provider that we can switch to.

WISHART: Thank you.

STINNER: Thank you. Additional questions? Seeing none, thank you.

RORIC PAULMAN: Thank you.

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JOHN BERGE: Before I get started, I want to congratulate Kate Bolz publicly for getting engaged to the handsome and gregarious Sean Flowerday.

BOLZ: I think it's the other way around.

JOHN BERGE: Thank you to Senators Bolz and Stinner for the opportunity to testify on LR209, and for their leadership on water resources issues. I believe that this is one of the most critically, critically important issues facing our state. My name is John Berge, J-o-h-n B-e-r-g-e, and I serve as the general manager of the North Platte Natural Resources District in Scottsbluff, Nebraska. Our district is a governmental organization in western Nebraska, encompasses, encompassing nearly 3.5 million acres of the Nebraska Panhandle, including a severely overappropriated portion of the North Platte River Basin and the overappropriated Pumpkin Creek Basin. Incidentally, I also serve on the advisory board for the Nebraska Water Center. During my tenure at the district, we have been working on innovative approaches to reduce consumptive use of water while maintaining and enhancing the economic viability of the landowners' agricultural operations affected by our management actions. While many of our efforts have been driven by mandates contained in LB962, much has also been driven by our desire to be good partners with water users in our area, to enhance stewardship and help them to realize savings. Under LB962 and the resulting integrated management plan, we

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were obligated to return 8,000 acre-feet of water to the North Platte River, and return, our depletion levels to pre-1997 levels of development. We have been massively successful in these endeavors, having returned over 23,000 acre-feet of water to the river, on average, and reduced depletion to pre-1997 levels, as required by statute and the IMP. We have done this with an appropriate balance of regulation and incentives, and have been recognized by our peers for our efforts. While we partner with many allies to accomplish our goals through collaborative conservation and developing innovative incentive programs, one of the most important partners in our efforts has been the University of Nebraska and its affiliates. The Daugherty Water for Food Institute, the Nebraska Water Center, and Nebraska Extension. I'm going to go through a summary of some of the things that we've worked on together with these folks, to, to illustrate that partnership. Since my becoming general manager of the North Platte NRD, those efforts have include, included DWFI electronic metering. While every irrigation well in our area is metered, we worked with the DWFI fly on a project to explore the use of electronic usage, to determine water use in our district. This project required a partnership between DWFI, local power districts, and landowners to aid in the installation of meters, set appropriate parameters for the study and to ensure that the requisite flow tests were completed on impacted wells. If successful, this could potentially serve as a very important cost and water management tool for growers in our area. That effort was at zero

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cost to our district. The DWFI irrigator application-- in consultation with DWFI, my staff and I worked with several undergraduate students at the Raikes School at the University, to provide advice and guidance on a water use application that they were developing for landowners. This tool would allow for monitoring and adjustment of water use remotely. We were approached because we had worked on a similar project for our growers, and our interest was to ensure that the resulting application was a useful tool for growers in our area. This effort was at nominal cost for just our staff time. The StreamNet proposal-- NPNRD has been working with DWFI fellow, Dr Jessica Corman, to develop a StreamNet project in Scotts Bluff County. This project will create a smart grid of sensors to monitor water quality, particularly in our streams and rivers. And the cost to our district, if the project is funded, will be worth \$20,000 of in-kind staff assistance. I participated in the DWFI delegation to the World Water Forum 8 in Brasilia, Brazil. I presented to a world audience on our offer, on our efforts in the area of regulation, incentives, and use of technology in water management in western Nebraska. More importantly, however, I was able to participate in several roundtable discussions regarding our unique system of local governance for water management in Nebraska-- the Natural Resources District. That was also at zero cost to our district. The Nebraska Water Center-- the Nebraska Water Center efforts on the on the Western Water issues meeting-- the Nebraska Water Center will be holding their fall water issues

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conference in Scottsbluff to highlight several of our NRD's activities, most importantly, the use of technology to improve irrigation efficiency in our district. The Nebraska Water Center has joined us in efforts on our PRECIP project, Nebraska Water Center as an adviser on the PRECIP project. This is a jointly held project by three Panhandle NRDs-- the North Platte, the Upper Niobrara, and the South Platte-- funded by the Nebraska Environmental Trust. In the North Platte NRD, PRECIP's purpose is to improve irrigation efficiency on flood irrigated land through, through a cost share of irrigation technology improvements. Cost to our district is \$25,000 each year for three years. The Nebraska Water Center will be a cosponsor of the Scottsbluff/Gering United Chamber of Commerce water tour in North Platte-- of the North Platte Project in 2020. This is an annual outreach event where we hope to host up to 100 policymakers and water users from across the region. You'll all be getting your invitations. The tour of the North Platte Project begins in Gering and makes it way through the project's reservoirs in Wyoming. The cost, the cost to our district is approximately \$3,000 in cash and in-kind contributions. DWI [SIC] and extension fellows, Dr. Bijesh Maharjan and Dr. Xin Qao, of the Nebraska, of Nebraska Extension, are principal investigators at North, North Platte NRD-funded research project to examine the use of variable rate irrigation speed control to promote the efficient use of water quantity, and appropriate use of nutrients to prevent or stem nitrate contamination of groundwater. The cost to our district is

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approximately \$100,000 over two years. We are also working with a DWFI fellow, Dr. Troy Gilmore, to ensure the appropriate management of our nearly 800 monitoring and observation wells in our network. Cost to our district has been nominal. We've also sent individuals, each of the last five years, to the Nebraska Water Leaders Academy, which is heavily influenced by both DWFI, the Nebraska Water Center, and Nebraska Extension, who participate in the instruction of those educational modules, that cost between \$2,000 and \$4,000 per year to our district. We participated in drought mitigation planning. In fact, I believe we were the first NRD in the state to complete a drought mitigation plan, about three years ago, and worked directly with the Nebraska Drought Mitigation Center at the University. And the cost to our district was \$20,000. We've also partnered with the Nebraska State Climatologist's [SIC] Office, housed at UNL, to expand our ability to provide real-time climate information to landowners in our district. And we took over the operation and maintenance of two of our, two of the mesonet stations held by the climatologist's office. And the cost for our district each year is \$5,200. The reason I'm pointing out the cost to our district is our district has gone through a period where we have cut nearly 30 percent of our operating budget in three years. That is due to a variety of reasons, not the least of which is we have been beat back on, on some of our budgetary authority through our levy. But we've also experienced what a lot of organizations are experiencing, and that is that grants, both state, federal, and

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private foundation grants are slim. So the work that the University has done with us has helped to supplement some of that work that we have normally paid for ourselves. It's also to say that a great deal of water expertise exists at the University of Nebraska and its affiliates. This expertise is invaluable in terms of the projects listed above, but also in terms of the informal advice and counsel. The University, Extension, DWFII, and Nebraska Water Center are fantastic repositories of expertise, valuable conduits to a broader network in the water community, and have impeccable credible, credibility across the world. The Legislature and the U.S. Congress would be wise to seek additional ways to fund their efforts in the future. Nebraska NRDs, surface water entities, state agencies associated with water, and those involved in production agriculture, in addition to the whole state, would be well served by such a move. I'd be happy to answer any questions that you might have.

STINNER: Thank you. Questions? I have a couple questions. One of them is, is that you might want to share with the committee surface water, groundwater-- the difference-- and how much surface water we have versus groundwater irrigation, because we are fairly unique out west.

JOHN BERGE: Yeah. We at, we-- in my NRD, we have 26 irrigation districts. That's more than the combination of irrigation districts throughout the rest of the state. Of our about 500,000 acres of irrigated land, only about 140,000 of those are groundwater only. So

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the rest are surface water. For those of you that don't know, or are too afraid to ask, surface water is, predominantly in my district is directly related to the North Platte River, which is wholly dependent upon snowfall and snowpack in the northern Colorado and southern Wyoming mountains. It is also subject to the rate at which that snow melts. So there are times that we have very high snowpack, but the flush is far too great in the beginning of the spring, and we still could be water short at the end of the year. The North Platte Project was the second authorized project of the, the Reclamation Act of 1902. It was built in 1906 and includes about 2 million acres of storage in the Wyoming mountains, 75 percent of which comes to Nebraska for irrigation purposes. To give you an indication of what that means, in 2012, when we had the hottest, driest year in reasonable memory, had we not had storage in those reservoirs, none of those irrigated acres of those 500,000 that were irrigated would have produced, because we received an average, across our district, of precipitation of about 4.5 inches of precip, precip that year.

STINNER: Which is the smallest amount since the Dust Bowl.

JOHN BERGE: Correct.

STINNER: And stream flow, obviously, is an important piece of that surface water irrigation. So some of, some of the techniques that you

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have used is, that all the NRDs have used to restore stream flow, has been to pull back allocated amounts per acre?

JOHN BERGE: Well, I would like to say that that's the case, but there's a number of NRDs across the state that do not limit pumping. I'm not judging them; they have their own circumstance.

STINNER: I should have qualified that--

JOHN BERGE: Fair enough.

STINNER: --to the districts that are fully and overappropriated.

JOHN BERGE: Our, our district, back in 2003, even before LB962 was passed, took some, I think, very progressive moves that have put us in a very good position. They set an allocation in the Pumpkin Creek Basin that year, and then set an allocation in the overappropriated portion of the North Platte River the following year. Had they not done that, I don't think we would be in the position that we're in today. Now they didn't set the allocation low enough. They adjusted that later on, and now we're reaping the benefits. But just to give you an indication, the allocation of the North Platte Basin is 70 inches over 5 years, which averages to 14 inches a year, which is a deficit level of irrigation in our area, based on the climate. Last year, an average grower in my area-- groundwater only, this is not supplemented by surface water-- grew very, very good corn crops with 9.5 inches of irrigation. This is in an area that gets 14 to 16 inches

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of rain per year. We are blessed with producers that have responded not only to regulation, but have reacted well to the innovation that we've put on the ground in terms of technology. Many of the technologies that Roric was talking about we have also put into place in our area. We have paid for cost share on a third of our flow meters. That's 863 flow meters in our district. You can get real-time pumping information. You can also turn each of those telemetry units into a miniaturized weather station. You can plug in soil moisture probes that you can utilize that information remotely for command and control of your irrigation system. We've made those investments because it's important to, not because we necessarily want to. They are expensive, but they're not nearly as expensive as taking land out of production, which we've also done a fair amount of. We're getting to the point now, given the, the way that we have accomplished goals, in contrast to the obligations that we had in our first increment of the IMP, that we are kind of on a maintenance scheme until we get a fully appropriated definition in concert with the Department of Natural Resources. We don't know whether that's going to be exactly where we're at or whether that could be 50,000 acre-feet. But we want to be in a position where we can be nimble enough to react to it. And I think technology, a lot of the work that these folks at the University are working on, that practitioners and producers like Roric have in the field, are the key to getting there.

STINNER: And it's always been my position when you take acres out of production or that you reduce allocated water amounts, it does affect yields. It does affect the economy. And so now it comes back to the use of technology to hit those water goals that you have. And rate of return, I get that part of it, and I think there's some good studies out there, but this, these farmers are going to need some kind of help to adapt their technology, whether it be variable speed pivots or telemetry or anything like that. What's the best bang for your buck on that? What's the best way of getting those dollars to the farmers? And it's my position that the NRDs are positioned to handle some of that .

JOHN BERGE: Well for a variety of different-- first of all, let me answer that, in probably a different way than is comfortable. We have a broad spectrum of producers in our district. We have a broad spectrum of producers across the state. And that's not just in in their desire to use technology like Roric, but it's also in their ability to pay for it. I had to refer four different producers this year to the suicide hotline that have called my office. So it was the first time in six years that I had had to do that. So the economy does have an impact on this. Cost share programs, Senator Wishart, when you were asking a question of Roric, I was thinking immediately to, well, gosh, they've got to get some more funding to the Nebraska Soil and Water Conservation Program to fund some of these technologies. But cost share programs don't help if there's not that, that ability to

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invest from the producer side as well. So starting with that and sort of setting that aside, I think it's important to note. I think the biggest bang for the buck in our area really has been the use of soil moisture probes, being able to understand, you know, like Roric said, when to turn on, how long to leave it on, and when to shut it off, is a very valuable tool. The other thing that's impacted us a great deal, John, as you know, is the improvement of efficiencies in irrigation delivery systems over the past 20 years has been immense.

STINNER: Um-hum.

JOHN BERGE: That's been a blessing and a curse. The blessing is that we're using less water in order to raise those crops. The curse is we're also losing the return flows from the what I used to call "slop water" in the system that eventually goes back to the creek. We've dealt with that. I think that on groundwater-only acres where you have flood irrigation, this is gravity irrigation. Just simply putting a tube in a row and letting it flow is very much on the decline. Out of those 500,000 acres, we've only got about 2,000 acres of flood-irrigated groundwater only left. So improving that has been an enormous change in the way that we manage water. But having soil moisture probes, being able to use climate information related to wind speed and direction and precipitation and the relative humidity, all of those things are important tools for landowners to be able to use. But beyond that, it's also just understanding your water use. We saw a

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decline of 17 percent in water use the moment that we put meters on.

Just understanding what you're using changes your behaviors. And I think that that's why the telemetry project that we started five years ago is an important one, because if you're able to access that information rather than driving out to a flow meter and looking at what you've used, you're more apt to reduce your usage. It's about cost. It's a pragmatic conversation about input cost. That's not a question about whether you're being wasteful, although I can make that argument. I think from the landowners' perspective-- I think Roric may agree with this, he tends to agree sometimes with me-- that, that really you're talking about how much money am I spending per acre to pump that water and do I need to spend it. With, with margins as tight as they are, I think those are questions that all landowners are facing.

STINNER: Right. The three-cent lid was taken-- or the three cents that you were allowed to assess--.

JOHN BERGE: Yes.

STINNER: --has been expired, 30 percent decline that you've seen in terms of grants and the like of that, I don't see that trend reversing, do you?

JOHN BERGE: No, I had a-- I was not there because I was here, but we held a meeting with our budget committee yesterday, talking about a

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couple of different things. But one of the items on the agenda was discussing what we're going to do in the next fiscal year. We have had a significant drop in our operational budget. And it's not just related to the three-cent levy, but that's certainly impacted us. We were able to use that three-cent-- and by the way, we never used the full amount; we used half a cent or maybe a cent at most. But those dollars that we were able to levy were solely for water management purposes. Keep in mind, the Legislature has given us 12 different authorities in statute. Only three of them are related to water. So I spend about 65 percent of my budget on water. And when I, when you take away those revenues for that purpose, I've got to take from other programs in order to maintain what's mandated to me from the Legislature. So it is impactful. Now I'm not going to cry "poor." We're going to figure it out. We've figured it out thus far. But the ability for us to remain progressive, and perhaps the ability for us to meet a fully appropriated level of development, as mandated under LB962, when that number is identified, is going to be limited because of that; it just simply is. So our other option, back to your original question, is, well, what do you do next? Well, you have to reduce allocations. And what that means for us is there is no more sugar industry. That means there could be a significant curtailing of the corn industry. That means we may become western Kansas. Now, there's nothing wrong with western Kansas, but our economy is propped up on the 300,000 head of cattle that live within 100 miles of you and I. It

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is propped up on a sugar industry that has been there since the early 1900s, and is propped up on the fact that we have an ethanol plant in the middle of our NRD. So if you take away the ability for us to grow irrigated crops to feed those industries, you're taking away a significant economic impact to the Panhandle. Just to illustrate that point a hair further, everybody heard about the canal collapse on the Gering/Fort Laramie District out in our area. Those 55,000 acres of irrigated ground. Those 55,000 acres in Nebraska, had they not had a crop insurance indemnity, would have been about a \$90 million economic impact to that area. That would be devastating. That would, that would overshadow what the Cabellas' situation in Cheyenne County-- probably tenfold, in terms of economic impact to our area.

STINNER: Just one last question. Next increment is due, has been due for a year or so. Is there any word of what, what that's going to look like [INAUDIBLE]?

JOHN BERGE: Yes. It-- the--

STINNER: We, we want to explain what the increment [INAUDIBLE].

JOHN BERGE: Sure. So the statute requires both an integrated management plan and a basin-wide plan be completed in, in ten-year increments toward a fully appropriated status.

WISHART: And can you explain what fully appropriated is?

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JOHN BERGE: I wish I could. I think you would have to call back in the Legislature from 2004 to ask them what they meant. That's something that {LAUGHTER}-- I'm not trying to be coy. That's something that we have struggled with, both as NRDS-- I think that people in the water world have struggled with for some time. I mean, I think, on the base of it, it means balance, right? But what does that balance mean? Does that mean that every user on a given river system is going to be accommodated for every use that's ever been allocated to them? If the answer to that is yes, then we don't have a-- we've never had a fully appropriated system. We have, you know, we have-- the prior appropriation system in Nebraska for water law is that you are first in time, first in right. If we were ever fully appropriated, we would have no need for a prior appropriation system, and I don't think that's what the, the authors intended. I believe what, in essence, it means is that the, your uses, as of some date-- and we're probably going to have to select a date-- but as of some date, are in balance. So groundwater users are kept whole and downstream surface water appropriators are kept whole. What it did not contemplate is new uses. City of Lincoln has grown 100,000 residents since I lived here 15-- well, I guess closer to 20-- years ago. And so did it contemplate that fact? We don't know what it's going to be, Senator Wishart; I wish we did. But I will tell you that, in answer your question, Senator Stinner, the first increment we were wildly successful with, with the goals and obligations that we set forth. We just went through a

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stakeholder project with the, for the second increment basin-wide plan and integrated management plan, because we were, I think, Platte Basin-wide, we were the NRD that really, I think, set, set a lot of markers as to what we need to do in the future. I think that we are now in a position, with the second increment, where we are simply going to maintain the level of development that we reached in the first increment, number one. And number two is we are going to finally plan for drought. That is now mandated in the plan in process, so that all of our neighboring NRDs will be part of that drought planning process and we will also have a basin-wide plan. I can't stress enough how difficult that is, because, quite frankly, Senator Wishart, I think the only time that we are have-- we would be out of balance in, under the current set of circumstances as we had, if we had an issue with supply coming down the river, I think that we have now narrowed our uses. Getting back to that post-1997 level, we have now narrowed our uses so that we have the kind of credit, going back to the river, that we have. I think that, only in, in the event of a, you know, four or five 2012s is in a row or a 2002-type drought, that's when you're going to see difficulties with downstream appropriators.

STINNER: OK. Any additional questions? Senator Wishart.

WISHART: So in terms of supply, how much, how much is what other states do, surrounding us, impacts our supply?

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JOHN BERGE: Well, I can only speak to the Platte Basin because, I think-- I mean, if I started speaking to the Republican Basin, I would be getting outside of my expertise, and much more conjecture than you would like. In the Patte Basin, not as much as we would hope. There were, there are two important events that occurred in the Platte Basin that sort of prevent the kind of, you know, us-versus-them, sort of, scenario. The first is what I described earlier, which was the establishment of the North Platte Project in the early 1900s. And the second is the North Platte Decree, and then the Associated Platte River Recovery Program [SIC]. The North Platte decree really stabilized what was determined to be the case when the North Platte Project was established, which is, we are allotted X number of of acre-feet-- in this particular sense, it's percentage-- we are allotted 75 percentage, percent of that project, and Wyoming is allotted 25 percent of that project. Where the headwaters are in northern Colorado, there's not a lot of uses that come out of the river. It really comes into the Wyoming and Nebraska basins, where where the water is being used. But the other thing, I think, that's important to point out is that because of that, the states have had to work cooperatively on the Platte River Recovery Program in order to ensure not having to consult on the Endangered Species Act. This was an effort that occurred, I believe, when Governor Nelson was Governor, and then was finalized when Governor Johanns was Governor. And basically it was a way for us to ensure that we were meeting the goals

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of the species. But we-- every time there was an effort on the river, there was not a need to go back to a cons, a consultative process with the Fish and Wildlife Service. Now whether you believe that's a good idea or a bad idea, I'm not here to to argue one way or the other. But I will tell you that it is a much quicker idea. When there is, you know, a refurbishing of a dam or a fixing of a diversion or those kinds of things, we don't have to go through this consultative study process that we might have otherwise needed to do. So that-- I think that's an important distinction, but it's far off topic from your question; I apologize.

WISHART: Thank you.

JOHN BERGE: You're welcome.

STINNER: There's, there's compacts that affect the legislation. Any additional questions? Seeing none, thank you.

JOHN BERGE: Thank you.

STINNER: Thanks for driving down.

JOHN BERGE: You bet.

STINNER: You get to go back to that high-crime neighborhood that I mentioned.

BOLZ: I'll be brief in closing.

STINNER: OK.

BOLZ: I just want to highlight just three takeaways to, to clarify the interim study here. And before I hit on those highlights. I want to reiterate how great it is that folks drove down and made the time for this today. We, we had several folks who literally drove the extra mile. Three brief takeaways just to clarify for the committee: The first is, I think it's important to describe the work of the Water for Food Institute as being urban, rural, and global. I think we've heard today about the importance to the ag industry, the importance to water quality expect, especially for growing urban populations, and the expertise and leadership that we're providing on the global stage in a world where we also have a growing population and demands on food and agricultural production. The second is, I think the timing is right to have this conversation. We have a significant request from the Emergency Management System around responses to the flooding. As we're responding to flooding and thinking about infrastructure and where we go from here, we should be evidence-based and technology-informed and working with the resources that we have at Water for Food. It's also an important moment in, I think, the, the world conversation around water and the environment. The last thing I want to say is that I think the question that I always have when we have conversations like these in Appropriations, is: What is the appropriate role of the state in this work? You've heard already today about the generous

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philanthropic support, about some of the other grant support and partnerships, and some of the other ways that they are sustaining this work. I think, just like we did with the Cancer Center and the iEXCEL Center, this is an opportunity for us to invest in the long-term best interests of the state. I think we have a role in contributing to the sustainability of the Water for Food Institute in a long-term way, at the table with other partners who are also making this happen. So I intend to bring legislation to provide an appropriation to the Water for Food Institute next legislative session, and I hope you'll join me in that support. I'm happy to take any final questions.

STINNER: Questions? How much are you going to request?

BOLZ: How much, how much can I get you to say yes to?

STINNER: That's up to the committee.

BOLZ: OK, thank you.

STINNER: Yeah. Thank you. That concludes our hearing. Thank you all for being here. Thank you, long distance travelers.