Season 2 Episode 4 – Alabama Drought Reach

August 22, 2024

Announcer:

From the Ground Up: a podcast of the Alabama Extension Home Grounds team educating you about home landscapes, gardens, and home pests.

Brian Brown:

Thank you for joining us today. My name is Brian Brown, and today we're going to talk about the Alabama Drought Reach program with Bree Minton and Dr. Lee Ellenburg. So welcome to our podcast.

Bree Minton:

Thank you so much for having us.

Lee Ellenburg:

Glad to be here.

Brian Brown:

All right Lee, let's start with you. Tell us how you got into, climatology and meteorology or what is it that you do? Tell us what you do.

Lee Ellenburg:

Sure. Absolutely. I serve as the Associate State climatologist for the state of Alabama, and focus a lot on water resources, drought and agriculture. I got my degrees in civil engineering and hydrology, and so I, you know, my physical training has been in hydrology and water resources, and I worked for several years with the NASA program. And then recently, well, maybe not recently so much anymore, three years ago now, I came, over to the UAH side and worked with Dr. Christie in the State Climate Office. So, my interest, revolve around trying to understand drought better for our water resources and for agriculture. And so, what that means in terms of soil moisture and streamflow, and the historical perspective of drought and what that looks like in the future.

Brian Brown:

And then Bree, tell us how you came into Extension. You've only been here about a year, right?

Bree Minton:

Yeah, yeah. As of today, as we're recording this podcast, I've been here officially for my first year. So, I went to college at Birmingham Southern College, got a degree in Urban Environmental science, which is kind of a combination of your traditional environmental science, but also environmental policy. So, when I graduated, I tried policy for a while, realized it wasn't quite the avenue that I was interested in, and I wanted to get back into a world of science communication outreach. I did a couple internships like that in college, really loved it. And the way that I actually got to Extension was through my working relationship with Lee Ellenburg at the climate office, because I was working with NASA at the time for one of their environmental science programs called "NASA Developed". I was leading a team that was looking at flash drought research in Alabama. That's how I met Lee. He was one of our science advisors. And he kind of became a mentor of mine. And when my NASA contract was coming to an end, it kind of coincided just perfectly with, him and Dr. Eve Brantley and Kent Stanford opening up this position of Alabama Drought Reach through the Auburn University Water Resources Center. He knew I had a strong interest in drought, also a strong interest and passion for science communication. And he showed me the job application, and I was like, I love everything about this. And, you know, here I am now a year later.

And so technically, I'm employed by the Auburn University Water Resources Center. That's who the Alabama Drought Reach program is through. But there was also, in part, funding by Alabama Extension and the Alabama State Climate Office, along with the AG experiment stations as well. And we look at anything that has to do with drought in Alabama: communications, outreach. We do some impact reporting, trying to better understand how drought affects agriculture, specifically with the hopes of growing into other areas, such as fisheries and horticulture and whatnot. But a lot of collaboration between the State Climate Office and Extension; that's kind of our main course of action, is to be the liaison between those two organizations.

Brian Brown:

If you don't mind, explain to me… I think a lot of people kind of get confused between climate and weather. So, if you don't mind, talk about that a little bit.

Lee Ellenburg:

Yeah, sure. I mean, the difference is, really in, in scale, both in size and in time. So weather, is systems that are shorter, on the week to two-week time frame, individual events. Climate, you're looking at decade long phenomena, right? Like you're looking at long term events and futures. And so, when we're talking about climate, we're talking about slow evolving systems that could potentially, you know, like for example, drought, right? Drought is a perfect example of, there may be short term and what we'd like to classify as flash droughts, which are kind of rapidly onsetting, dry conditions. But the difference in climate and weather really has to do with scale. Both, like I said, both in space and in time.

Brian Brown:

What are some of the primary causes of drought? And then of course, that means no water, right. So, but what are, is there… is there things in our changing weather patterns or what is it that really is the main cause or the driver of drought?

Lee Ellenburg:

At a fundamental level, right, the lack of rainfall is what initiates the onset of what we call dry conditions or drought. There's a host of different types of drought, and they're really defined by their impacts. So, we have short term meteorological drought. That's when it doesn't rain for a week or two, right. We have agricultural drought, when that rain, that lack of rain translates to a, you know, a deficit of soil moisture, which can affect crops. You know, once that moves on to month or two, then you start affecting long term, water stores, right. Like reservoirs and stream flow start to be affected. That's the water resources drought, right.

And even further on, you can have environmental droughts and socioeconomic droughts. And so, there's a whole range of different types of, of droughts. But really what this means is the lack of moisture, right. And so, we define them a lot by their impact. So ag drought, water resources drought, you know, ecosystem drought. But that, you know, in the Southeast, we, you know, we have a couple of different varieties, you know, the longer term droughts that, if you think back to the 2007-08 drought where you just had perpetual, you know, high, high systems that kind of came into the region and just depressed rain over, over a long period of time. You know, more frequently and a lot more, I guess readily available use cases are these what we call flash droughts, where, you know, a lot of times in the fall, we have our driest month in September, October. And if that coincides with a high-pressure system and it just doesn't rain, right, there's going to be really rapid onset conditions that can really affect a lot of our ag producers as well as water resources.

And then in the, you know, we get a lot of rain in Alabama, right? 55 to 60, 70 inches of rain at the coast. That's a lot of rain. And so, a lot of people are like, 'how can you have drought when you know it rains 60 inches a year on average?' But that's just the case. That average amount is just average. It goes from, you know, 40 inches to 70 inches. And you know, it's really hot. We have a lot of vegetation. We have a lot of water use in the state. And so, all it takes is a week or two of no rain and immediately you're in dry conditions because our ecosystems have evolved, to, to use that water, right. We get 60 inches of rain in our ecosystem. All the trees that you see, all the grass, it's very green down here. We need every bit of it.

Brian Brown:

Yeah. And that you're dealing with homeowners. You know, we always talk about yeah, we get plenty of rain but it's not at the right time. Yeah. And that's, that's what we're really looking at is, you know, these droughts that can occur.

And I remember the 2007, 2008 or whenever that was. And I was living in Auburn at the time and, I don't think we had any measurable rain from August all the way until like, mid-October.

Lee Ellenburg:

Yep.

Brian Brown:

And it was it was, it was really bad. And for a homeowner, we're seeing a lot of those effects, especially on trees, way down the road, you know, like three, four, five years down the road. That's when you start seeing it on trees. You'll see immediate impacts in things like your succulents or your gardens, things like that, immediately. But that long term effect that's really, really bad for trees. So, you know, it's hard to tell somebody, "Well, that was from five years ago", you know. It doesn't really translate well to a homeowner, but that's just the truth of the matter. Trees are really resilient, and they just, you know, they'll see the effects later on and down the road.

Are we having more droughts than we have in the past? I would, let's say 20, 50, 100 years?

Lee Ellenburg:

Not necessarily. I think if you look at the long-term trends, there's some reconstructed data sets using tree rings that go back, you know, 100 years, we've had a couple big droughts in the past, say 20, 30 years. And so those are notable. And so, a lot of times they're the most recent in our memory. But if you go back, you know, we've had some major droughts in our past, in the 1950s, the 1930s. Go back to the late 1800s, where there's some, you know, old Extension reports that basically talk about the Warrior River drying up and having massive fish kills, right.

We're not immune to them. They happen, and they're going to continue to happen. Are they happening more frequently? You know, there's some indication that there could be some, potential for an increased in, you know, flash droughts, but the data is not showing that just yet, right. So, some of our models going out forward are showing there could be some indications, but it's not being seen in the data just yet.

So, I would say no, not really increasing all that much. But there's a potential and more importantly when I talk to people about drought, you know, if they ask, 'is it going to happen again'? Yes. It's going to be dry, right. There's going to be a drought. In any given year, there's going to be somewhere in Alabama that doesn't get the right amount of rainfall at the right time. And so, if you have corn planted there, you're going to be suffered, right? If you have if you're whatever grass or crops or lawn, gardens that you have, if you're somewhere in Alabama, any given year, it's not going to be enough rain most likely. And so always be prepared for drought.

Brian Brown:

So, what do you think can be some ways that somebody could prepare for drought?

Lee Ellenburg:

Well, you know, well obviously irrigation is a big one right, that's a big thing. And being able to, to supplement irrigation in those small, you know, windows where it's like, oh, well, I know that this month I'm probably going to get six inches, but that didn't happen for these two weeks, right. So supplemental irrigation is really important.

And also, I mean, planting native drought-primed species and plants, I think are really helpful. And again, in Alabama, that means most things because it rains so much. But, yeah, I would say focusing on the type of vegetation that you have in the plants, but and also like, just create your own weather, right. Use irrigation and implement that I think is really, really important.

Brian Brown:

Do you think the urban centers have anything to do with… I know around metropolitan areas temperature tends to rise a lot. So, does that have any effect on these situations?

Lee Ellenburg:

I'm not exactly sure. There's, there's still some research out on trying to understand exactly the influence of urban, the urban environment on, on surrounding areas.

You know, one thing that's really important is the nighttime temperatures. Yeah, the urban centers do get really hot during the day, but they also hold that heat in, and so you get very, you know, like these really high, nighttime temperatures that could, you know, especially for home gardens within urban centers, that can have big effects on, on plants, and a lot of different crops.

And so, the nighttime, the raised nighttime temperature, can have an impact. But, I mean, it's safe to say there is some impact, but I think we there's not enough research out there just yet trying to determine exactly what that looks like.

Brian Brown:

I know dealing with homeowners that I do- and, you know, that's kind of my perspective on everything is from the homeowner perspective -you know, that's the team I'm on- so I think one of the biggest things is water management. Not just irrigation, but, you know, what is the runoff doing, especially in urban areas, because, you know, you can get a lot of runoff and what are you going to do with that water? So that's I know that's a huge problem out there, putting the water where it needs to go is very important. And I don't know what else to say there.

Lee Ellenburg:

So, I mean, I think it's a good point. And I'm going to make a plug for a citizen science rain gauge network called CoCoRaHS. Understanding how much water you got, right. Knowing that when, when to irrigate. Don't irrigate in the middle of the day, right.

How many times can we- we can't say that enough- and I still I drive through every town and there's sprinklers going off at noon, you know, and it's bright and sunny, right. That's a very wasteful, you know, application of water. Irrigate, you know, in the evenings and in the mornings when the evaporation is not high.

But also knowing how much rain you got, right, and understanding, like when you need to irrigate, don't wait till its bone dry. And also, don't irrigate after rain, right. Have smart systems that you can time your irrigation correctly. Or just be aware and, you know, turn it on when you need it and don't turn it on when you don't need it, right. "

But there's a citizen science program called CoCoRaHS. And I don't remember the definition of the acronym, it's huge…

[Editor's note: It stands for Community Collaborative Rain, Hail & Snow Network]

Brian Brown:

How do you spell that?

Lee Ellenburg:

CoCoRaHS. I'll send you a link. And, and all you have to do sign up. I think the gauge, you can buy a gauge for 50 bucks, you know, and, put it out there, you can report it. We get that information as well. We use that to help us analyze drought, understand where it's at. And so, it's a great way to both benefit the climate office, our broader understanding of regional rain patterns. What that means on drought but also like understanding like if you measure your own rain, right, and know how much it rains every day and get a long time series of information, it opens your eyes up to what exactly is happening in your own yard and your own farm, wherever that may be.

Brian Brown:

That's really cool. And I know there's a lot of people who want to, especially homeowners, that want to participate in something like that. And for you, the more data, the better.

Lee Ellenburg:

Exactly.

Brian Brown:

So, especially if it's distributed evenly across the state, that's like the perfect scenario you want to have.

Lee Ellenburg:

That's exactly right

Brian Brown:

And, you know, going back to irrigation. This time in the world timeline, there's no better time to put in irrigation because you have these smart controllers that know if you're getting rain in the future or if it has rained in the past, you know, they can kind of time it.

You know, you don't have to run an irrigation system every day. And if you do run one, you need to run it for the right amount of time, you know, based on your soil type, you know, how many plants you have in the ground, what type of plants you have in the ground, what those requirements are. So, it may run your water bill up a few times in the month or throughout the year, but for the most part, we do get enough water that if you do want to take care of things, it's a smart thing to put in an irrigation system.

Lee Ellenburg:

Yeah. Understanding the impacts of drought, I think has been really important to our climate office. I'm going to transition here to talk about the Drought Reach.

When we talked about the definitions of drought earlier, as I mentioned, the impacts are what really drives our definitions of drought, right? Yes, yes, it's less rainfall, right. There's lower soil moisture, there's low streamflow. Those are some very physical indicators. But what really matters to us is when it starts to impact somebody and specifically with the work that we're doing with the Drought Reach, it's been with agriculture.

You know, we worked, have been always really closely working, with the water resources here in Auburn, the State Climate Office, I think we work really well together. And so, you know, obviously Extension has feelers and understanding of ag in every county and every region. And so, it made a lot of sense for us to partner together and create this program like Drought Reach, to help us get information from the ground of what's actually being impacted.

So, when we go through these droughts where that's, again, a lot of times it's based on crops. But, you know, the whole the whole gamut of impacts. And so, Bree kind of came in to lead up this program called Drought Reach to help us understand the impacts, but then also to take this information and then bring it back out to the community to help them understand what is drought. So, you know, creating a bunch of communication avenues, setting up stuff like this, right, to just help us. You know, she's she's just been amazing.

Bree Minton:

Thanks, Lee

Brian Brown:

So yeah. Tell us more about the program. You you've hit a lot of that. So, tell us your own side of this.

Bree Minton:

Yeah. So, Alabama Drought Reach is, at its core a drought communications and outreach program. But we're kind of twofold in what we do. So, on the one hand we do comms - so trying to push out material to the public at large so that everybody in the state knows when they're being impacted by drought or what they can do during times of drought.

We also do communications specifically with Extension, making sure that every employee at Extension, even if they don't have a background in agriculture or even if they just do, but they may not have as much knowledge in the world of drought, I do internal trainings and communications to make sure everybody at Extension has information they need to help the constituents in their county or in their region.

So that's one half of ADR. So, ADR being Alabama Drought Reach. So, I create weekly drought graphics, using information from the U.S. Drought Monitor map of Alabama. And you can find those graphics on our website, Alabama Drought Reach. You can also sign up for our monthly newsletter on our website. And I will send all sorts of information at the end of every month about what happened with drought, what we could look forward to in terms of drought, what the predictive component is.

And then I also do a lot of graphic creation for the State Climate Office as well. So that's one side of ADR. And the other side, like Lee said, is trying to understand the impacts to our state right now, specifically with agriculture specifically, row crop and (Lee) production ag, yeah, production ag, thank you.

And there's a couple different ways that we're doing this. One is an internal survey that we have created for just the employees of Extension. So that way it's a, a one-way street straight from Extension to the State Climate Office. And this is an internal report that our Extension employees fill out. And they let us know what conditions are seeing on the ground that gets funneled directly to the State Climate Office. And all of that data can then be utilized when Lee and Dr. Rob Junod at the State Climate Office, when they meet every week to give input on drought conditions in Alabama to the U.S. Drought Monitor map.

And I'll take a quick pause there for anybody who doesn't know what the U.S. Drought Monitor map is. It's a tool created at the University of Nebraska-Lincoln with a bunch of authors all over the country. So, it looks at present drought conditions and severity across all 50 states and our U.S territories. It comes out every Thursday morning on the U.S. Drought Monitor website. And so, the authors of the map out of the University of Nebraska-Lincoln and the National Drought Mitigation Center, they get input directly from organizations in each state. So, for us here, it's the Alabama State Climate Office.

They get weekly input of what the drought conditions are in that specific state. So, Lee can use data from this internal survey we have at Extension, from phone calls that I get from Extension, or from producers, and just from his own working relationship with people and ag. He can take all of that on-the-ground impact data to help create a more accurate drought map of Alabama. So, to make sure that the lines are drawn correctly, the severity is correct on the map.

And even if you're not in Extension and you're wondering, ‘you know, is there a way for me to report drought on my own property?’ the answer is yes. So, I'll plug another public tool in here, which was created by the USDA in partnership with the National Drought Mitigation Center. And it's called CMOR which is Condition Monitoring Observer Reports.

And this is a public tool for anybody. And you can fill out the conditions of drought on your property. And it can be specific to whatever you're using your property for. So, it could just be home ground, you could just say my lawn is brown.

It could be ag. You could talk about wilting crops or stressed livestock. It could be reservoirs or stormwater management, whatever you're using that specific property for, you can plug that information into the CMOR survey and talk about how drought is impacting you.

In a nutshell, ADR does communications and we do drought impact monitoring. And the communications is to make sure that everyone in the public has a strong understanding of how drought, where it's occurring in the state and how it's impacting us, and the impact monitoring is to make sure that the State Climate Office has as much detailed information as they can get to make a more accurate drought map of Alabama at the U.S. Drought Monitor.

Brian Brown:

So, what's the lag time in between the time you get the data until the time you see it on the USDA maps that they put out?

Lee Ellenburg:

That's a really good question. You know, the Drought Monitor, the big Drought Monitor map is, is meant to be an all-encompassing perspective of drought, right. So, it doesn't really respond too quickly, sometimes, at least in the Southeast where we see conditions rapidly increasing. And so sometimes it could be a week or 2 or 3 weeks before, like, it picks up, just because we're looking, you know, from the Drought Monitor, you're looking at, at time aggregates at the 30, 60, 90 days, right. And so sometimes these impacts can happen at the two to three-to-four-week periods. And so, we try our best. That's where I think the State Climate Office and in partnership with the Drought Reach program, are able to provide those rapid, deteriorating conditions to help us push that time lag to be less and less and less.

But yeah, but you know, it again, just in terms of time lag of impact like that can be a week or two weeks in Alabama, right. If it happens at the right time, you know, if you're growing corn in north Alabama and it doesn't rain for two weeks at the end of June, you're in trouble, right, you're in big trouble. And then it could rain another three inches the rest of that month. But that impact has already been seen.

And so we're trying to create tools, products and, you know, and capabilities to be able to understand those, report those back to, to that, you know, basically get that, get the data from the farms, report that up to the Drought Monitor, but also create our own products and capabilities to help as many people as we can and both understand and also maybe even help them, you know, get some relief in the long run.

Brian Brown:

Yeah. So how does this data, you know, they put out the maps and everything. So how does the farmer use that data or how does that impact their their growing as far as, like, is there assistance available based on this?

Bree Minton:

Yeah. So that's a great question. So, the U.S Drought Monitor map, the only federal funding that it directly correlates to is called LFP, the Livestock Forage Disaster Program. This is through USDA. And as it sounds, it's for

livestock and forage. And so, once a county is represented on the U.S drought monitor map in a certain category. So, I'll give the details just in case anybody's interested. But if you're if anywhere in your county is in D2 severe drought for eight or more weeks, or if anywhere in your county is in D3 or D4 drought, which is extreme or exceptional drought for even just one week, then, that whole county actually becomes eligible for LFP. So, it could even just be, you know, 5% of that county is covered in that drought severity. But the whole county, any producer in that county, becomes eligible for LFP.

The way you can get that funding is you can go directly to your FSA office. If you need help finding your local FSA office, feel free to call Extension, they can help you figure out who that office is, but you go directly to your local FSA office.

And then there's of course the paperwork and whatnot to fill out. But they, they are the ones who will actually help you get that funding from LFP. So, the Livestock Forage Program is the only USDA relief funding that I know of that is directly instigated by the U.S Drought Monitor map. But all of the impact data that we're collecting on the back end to create the U.S Drought Monitor map can also be used for other relief opportunities as well.

So, the other there's another opportunity for farmers to get relief funding during a drought. But it's not directly correlated to the U.S Drought Monitor map. Although all of the impact data that we collect on the back end to create the U.S Drought Monitor map of Alabama, or to give input on the U.S Drought Monitor map of Alabama, can be utilized for a program called NAP n-a-p, which is Noninsured Crop Disaster Assistance Program.

This is kind of similar to signing up for car insurance. You sign up for it at the beginning of the year, you pay a premium, and then whenever you are impacted by drought, you go again, I believe, to your local FSA office, and you say that you want to put in for that NAP coverage that you paid for at the beginning of the year.

This is not, like I said, directly tied to the U.S Drought Monitor map. But whenever FSA gets a call for someone who wants to make a NAP claim, they will reach out for folks for independent assessments, oftentimes somebody in Extension, and they'll say, based on your knowledge and expertise, and the data that you have, what's the what's the crop loss potential due to the drought that just came through?

So, then Extension will reach out to me and they'll ask for data on impacts, climatological information about drought, precipitation, soil moisture, all that kind of stuff. And so, all that impact data that I've been collecting for, you know, weeks at that point, I can funnel directly back to Extension or back to whoever it's filling out that NAP claim assessment.

And they can utilize it to say, based on this data, we believe there was this percent crop loss due to drought. So, there's a lot of funding opportunities out there for producers who are impacted during drought. LFP is the only one that directly correlates with U.S Drought Monitor map. But there are other options for FSA where all of the data we're collecting on impacts can really help to strengthen, the potential to get relief funding.

Lee Ellenburg:

Another great product I think the State Climate Office, we produce, is called the Lawn and Garden Index. Not sure if you're familiar with that or not, but it's a daily product we produce every day on our website. And

essentially what it does is it, it measures the relative capacity of the last recent rainfall to support healthy, short vegetated crops, right. Which typically revolves around, you know, lawn and gardens.

And so, we what we do is we take the, you know, the past week's rainfall and then we take a little bit of the week before and the week before, kind of wait out like the past three weeks rainfall, and basically assess how much of that, is being able to support the current vegetation.

And so, this is a product that we have. And so, it, you know, it's really easy to see- it's red, yellow, green depictions of where drought is, short term drought is. And so, it's a product that I think a lot of lawn and garden folks, and anyone who's interested in trying to keep track of the stressors on their crops or their or their gardens would be a really great, opportunity. I can also send that, that that link away. Yeah.

Brian Brown:

That'd be that'd be excellent. Because I know there's a lot of Master Gardeners and others who are interested and that listen to this podcast often. So, they're going to be really excited about how can they can contribute. And again, being the citizen science. So, and what was the website again?

Lee Ellenburg:

So, the Community Collaborative Rain Hail and Snow Network this is called the CoCoRaHS and it's a great citizen science program where you can, again, you purchase a relatively cheap rain gauge. And then you sign up and you just report your rain every day at nine, at 7:00 in the morning, 7:30, just be consistent, whatever time that is. You put that into the website that becomes available to us at the Climate Office. We I use that on a weekly basis to understand where and how much it rained and what that what those trends look like for drought.

But also, it opens up an entire capability for you to also look and see how much you know, how much it rained across the county or how much it didn't rain. Or if you start reporting for a while, you get all your data in a very nice and easy way to look at; Understand how you know what's the normal rainfall it should be. How much did you get? It's just an incredible, website and network. And so, I encourage everyone who's interested in gardening and weather and drought and rain and, you know, gardens, whatever, should, sign up for CoCoRaHS because it helps us tremendously.

Brian Brown:

Awesome. Well, thank our two for being here. If you have any questions that you would like to reach out, feel free to contact your local Extension agent or Bree, you can be found on the Extension website.

Bree Minton:

Yep. The Extension website. You can also find our program just by googling Alabama Drought Reach. It's nested within the Water Resources Center's website at Auburn. If you also if you ever need information about the current drought conditions or if you ever need any kind of data for, you know, whatever you're doing concerning drought, you can also email me at drought@auburn.edu.

Brian Brown:

Awesome. Well, thank you again for being here. And again, do you have any questions about any of this? Feel free to contact your local Extension agent.

From the Ground Up is a production of the Alabama Cooperative Extension System.