



Season 6 Episode 3—Climate Outlook

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Announcer:

The Alabama Crops Report Podcast, your trusted information source for Alabama agriculture.

Chandler Gruener

Welcome everyone into the Alabama Craft Report podcast. My name is Chandler Gardner, and I'm joined with

Josh Lee

Josh Lee, cotton specialist here at Auburn University.

Brenda Ortiz

Brenda Ortiz, precision agricultural extension specialist, Auburn University, Alabama Cooperative Extension System.

Chandler Gruener

And today our guest is David Zierden, Florida state climatologist. David is well known by the farming community in the southeastern USA, and he frequently speaks at a lot of our vents, like he was at our

cotton expo we had down in Wiregrass this year, and he was at the row crop short course in Prattville. Is there any other introduction you'd like to give, David?

David Zierden

I think that'll do it. I appreciate being here. I've been involved with agriculture here in the tri state area for, 20, 25 years now. And, I still don't know a lot about agriculture, but I'm glad I can provide information that helps the farming community.

Chandler Gruener

Sounds good. So our first question today is kind of like getting us into the realm of. So could you share some details about the major fall climate trends, any potential connections to this January and February, March and April as we kind of move into the spring here. We're in February now. And so kind of anything that happened in the fall, the climate trends that kind of lead towards spring changes.

David Zierden

Well, in doing these seasonal climate forecast and trying to anticipate what our patterns will be, the major thing we look at is the state of the Pacific Ocean, whether we're in the El Nino or La Nina phase. Real quickly, and as background, El Nino is when there's much warmer than normal ocean temperatures in the Pacific Ocean, basically along the equator from the coast of Peru all the way to the International Date Line.

David Zierden

And when we have this El Nino in place, it usually leads to fall, winter, spring weather patterns that are, wetter, stormier, cloudier and even cooler than normal. The opposite phase is La Nina when we have cold water in the Pacific Ocean, in that same area. And that leads to a warmer, usually leads to a warmer and drier fall, winter and spring season.

David Zierden

And we have been in that La Nina phase, on and off for the past two years. Including this fall and winter. So that has been a contributor to the developing drought we're seeing across the Southeast and Southeast Alabama and most of Georgia, all of Florida.

Brenda Ortiz

Okay, so, David, it seems that extreme weather events are becoming more common than what we have experienced, in the southeast in past years. One example is this extreme low temperature and temperatures across the southeast US. How can we explain these events? And are these events having

any, you know, relationship with, perhaps El Nino, La Nina, or, you know, this fall, you know, weather trends that we have been looking, in in the past years?

David Zierden

Okay. Talking about extreme events, but let's first talk about the cold weather we've been experiencing and the winter weather we've been experiencing this year. There's a relatively new, branch of the science that monitors...we've all heard of the polar vortex. That's, a fixture in the atmosphere 30 miles high above the poles. But it's when this polar vortex becomes unstable, slows down, or even splits is when we are very susceptible to these.

David Zierden

It feeds down through the atmosphere. And we're very susceptible to these cold weather outbreaks like we've experienced this year. I remember another year, 2010, when we experienced almost two and a half months of cold weather. So that's been a player, over the last, several weeks or even month, and brought us this cold and winter weather.

David Zierden

It looks like things are stabilizing now, and we're in for a warm up, so no further cold weather's anticipated.

David Zierden

You ask? It is, is there a climate relation? It's not related to the El Nino-La Nina cycle at all. There are, some studies that postulate that as the Arctic warms and it's warming three times faster than the rest of the planet, that this kind of polar vortex disruption will become more common. So that's in the research.

David Zierden

That's still up for debate. It may be a player, but I wouldn't go that far. Just this is one thing that happens, and it certainly happened this year. The other side of extreme events is extreme rainfall, and that is very well-researched and documented, both from observational studies and modeling studies that as the global climate warms, as the northern Hemisphere climate warms, there's more warmth and moisture available in the atmosphere for heavy rainfall events. So while seasonal rainfall patterns might not be changing that much, we are getting more rainfall from these extreme events. That's something that's certainly concerning to the farming community. How to take advantage of these extreme rainfall events or how to mitigate the damage.

Chandler Gruener

So last year we had a lot of rainfall in the springtime. And then now, as you said, we're kind of in a drought earlier. So what do you think we're going to transition to? Are we going to stay drought, drought and then all of a sudden have heavy rains this year? What can kind of farmers to kind of anticipate for this season?

David Zierden

The crystal ball is only so clear when looking at, these kind of things. Like I said earlier, we are in that La Nina or cold water phase in the Pacific Ocean, which typically leads to warmer, drier winters and right now that La Nina is forecast to break apart in the next month or two, so it won't be a player much after March.

David Zierden

But there's some memory in the system, the ocean atmosphere system. So the best, the best guess or the best forecast is for continued drier than normal conditions. The Climate Prediction Center's official forecasts indicate a fairly strong lean towards warmer and drier conditions as we go through February, March and into April. After that, with the breakdown of La Nina, there's not a real indicator.

David Zierden

As we go into spring and early summer.

Josh Lee

Okay, I got you. So, you know, thinking about cotton production, you know, we're going to be off to the races in April. So what? What would you say for our cotton growers, especially in the parts of northern, northern Alabama, do you think that those temperatures, you know, we talked about we're going to have warmer events. Do you think that we're going to have good timing of warm events?

Josh Lee

You think we can get in there, you know, early even before maybe April 15th, you know, to start planting. Do you think those events are able to come or the crystal ball in isn't as clear for those conditions yet?

David Zierden

Oh, that's a great question. We have we have looked at, the occurrence and timing of, these late season freezes. That could really be a big step back if you try to plant early. We really found no connection with the El Nino-La Nina cycle at all. We really haven't seen any trend on whether these freezes are coming sooner or later.

David Zierden

It's it just depends on that... that's more weather driven. If we get a very strong weather system, as late as early April, it could do a lot of damage. So that's not something that is really predictable right now.

Brenda Ortiz

Okay. So, David, you mentioned, we are right now in the La Nina phase of ENSO, but yes it's warmer and drier normally for many, many years in the southern counties of Alabama. But it's a little wetter in the northeast corner of Alabama. And one thing that concerns me a lot is that normally it's during the winter months that we can that our groundwater or the aquifers recharge.

Brenda Ortiz

So if we are not, you know, experiencing the rainfall amount and frequency that we normally have, perhaps the aquifers are not going to recharge by the time of planting of our summer crops. And if we have farmers that irrigate, especially corn growers, that might be, you know, an issue for them. What can you tell us about these issues?

Brenda Ortiz

And perhaps, is this drought connected to what's happened in the fall? How can we explain? And what do you see the impacts could be?

David Zierden

Oh, those are a lot of great points. Yes. January through March is the peak recharge season for groundwater, rivers, the surface water, all of that. And we have not gotten that this year. Maybe in northern Alabama, I'm not sure, but certainly down here in the tri state area, Florida Panhandle, southern Georgia. Right now, groundwater and stream flows are critically low in what should be the recharge season.

David Zierden

So if things don't turn around drastically and soon, there's going to be water shortages coming into the spring and early summer and planting season and water availability for irrigation is going to be a huge problem. Down here in North Florida and South Georgia, we're in, D. According to the US Drought Monitor, we're in D3 or, extreme drought.

David Zierden

And most of the river levels are in the bottom 5% of flows. So, yeah, it's a critical problem right now. And if things don't turn around quickly, the climate gets drier as we go into late March. And April is a typically drier time of the year. It'll be problematic for the whole growing season.

Chandler Gruener

Okay. So is we're talking about like dry in the springtime kind of dry. How does that going to tie back into the summertime. So if we don't get some big rainfall events we'll be drier through the summertime. When will the recharge come. Like is there a certain good time. Is it we wait until next winter. When do you think?

David Zierden

Well, again, winter is the normal recharge period for, for rivers, the major rivers and groundwater, that filters down to the to the coastal areas. So yeah, we don't get it by summertime, especially as we get into in inland Alabama, inland Georgia, summer rainfall is very spotty. And it doesn't even keep up with evapotranspiration.

David Zierden

So there's not going to be a lot of recharge unless we get a tropical system or two or something like that. Which leads me into my next point is that's one of the causes for the drought we're experiencing now is the lack of tropical systems this year. There were no tropical systems that made landfall or were even viable in the Gulf of Mexico.

David Zierden

And compare that to like the record setting year of 2020, when we had nine northern Gulf and Gulf Coast landfalls. So we missed out on tropical rainfall. And the other side of that is the as the major hurricanes like hurricane, what was it? Aaron and Hurricane Melissa kind of went up the offshore of the East Coast of the United States.

David Zierden

That leaves us here in the southeast, on the western periphery, where we see subsidence, amplified high pressure, drier air, and just a lack of rainfall following the passage of these major hurricanes. And that's what we saw this year. Like we've seen before, in 2023 with Hurricane Idalia, 2019, 2016 with Hurricane Matthew. We've seen that same effect time and time again, where if we if the United States getting missed by one of these really strong hurricanes, it can lead to a real period of dryness following their passage.

Josh Lee

Sure. So definitely something to think about. You know, from a crop production standpoint. You know, thinking about the 2025 season, you know, it turned really dry here in Alabama, turned really dry in August and September, which, you know, it hurt and helped growers, helped a bunch. And it hurt, you know, hurt a few. You know, we had record cotton yields this past year over two bale, which is very impressive.

Josh Lee

And just noticing overall, you know, we had a little bit of we have fairly good quality, noticed some high mic in a couple areas. But do you think that those conditions? You know, we were thankful that we didn't have a hurricane or a tropical storm that always delays or harvest delays, you know, all that kind of stuff getting cotton in.

Josh Lee

Do you think that we would have these conditions maybe in the '26 season? And I know that's something really, really long to look down, but do you think we'd have a year like '25 again in '26, or do you think it would be something completely different?

David Zierden

The only thing I can say about, the cotton season for, for this coming year, 2026, is that, I talk about this El Nino-La Nina cycle. Some of the forecast, especially the European model, is very well trusted. Their long-range outlooks are indicating the transition to the El Nino phase in the summer.

David Zierden

And fall of 2026. And if that was to happen, it would mean two things. It would usually indicate, less active hurricane season, which as far as wind and rain damage, that would be good news. And possibly a dry fall, which was great through the cotton harvest this year, as I understand. But then it would also mean, an increase in rainfall once we get into late October and November.

David Zierden

But, but yeah, from my understanding, the, the early season rainfall that Alabama, experienced in May and early June, an okay summer and then the drying as, harvest season approached was, was, just what you'd like for the cotton crop. I, I've heard that across Georgia, North Florida.

Chandler Gruener

Right. So kind of is there any longer term impacts. So we've been kind of talking about the 2026 season. So as we're going through these, again, the extreme weather cycles, do we anticipate planting

to move a little bit earlier. And then what's the how's that going to kind of impact from the rain standpoint? Because we're talking about these droughts.

Chandler Gruener

And so we're switching to the opposite right now. So we're in one phase and then we're moving to the next. So when you're thinking about planning for 2027, what does that look like?

David Zierden

Oh you're talking about like a year from now.

Chandler Gruener

Yeah year from now. So like if you're picking a crop for this season based on your planting, when you get shifted in, then how is that going to be impacted from the changing of the weather patterns?

David Zierden

All we can say about that is, well, right now is kind of a blind spot. I said some of the models are indicating a switch to El Nino, and that would certainly provide more moisture for planting season next year in 2027. But that's not a sure thing at all. This is a really a blind time of the year.

David Zierden

This cycle in the Pacific Ocean is tied to the seasonal cycle, and it's this is a really hard time of the year to predict. So as far as that switch to El Nino, I'm in very much a wait and see mode. If that was to happen, we probably have a wetter winter and, better moisture conditions going into the planting season in 2027.

Chandler Gruener

So. So I was wondering if there's something like this fall would kind of give us an indication that we're making that switch into the El Nino or winter time. When's that indicator kind of come to us?

David Zierden

Through both late summer or fall. We won't know for sure until that.

Brenda Ortiz

So we, we have been talking about climate variability. But let's talk let's, let's come back to, you know, winter and spring season. So what are the current season and outlooks look like in terms of temperature and rainfall in Alabama for the next three months?

David Zierden

For the next three months, the, the Climate Prediction Center and the National Weather Service's Climate Prediction Center, their official outlook is, pretty strong lean for above normal temperature to return and below normal rainfall. So that's primarily based on still being in this La Nina phase or cold water phase in the Pacific Ocean. Further out, as we get into the summer, there's just not a lot of climate predictability, except for one thing, the temperature outlooks consistently over the past five to or more ten years show an increased risk of above normal temperatures.

David Zierden

And that's just based on the prevailing trend, the warming climate we're in. And we've seen warm summer after warm summer. This past summer was an exception. With all the rain we had in May and June, it was actually close to normal... the temperature was across Alabama, and it was kind of a reprieve from this warming we've seen. But that doesn't mean it's going to happen again next year or this year.

Brenda Ortiz

So there might be farmers out there still trying to make decisions in terms of which crop to plant. And I think that these issues with warmer and drier conditions in the spring may play an important role in in deciding you.

Josh Lee

Sure, sure. For sure. You know, you know, thinking about the '25 season, you know, we got kind of our backs up against a wall. You know, North Alabama kind of ran out of season, you know for planning for a planning window. And guys either had to, you know, go fallow or pick another crop to plant instead of cotton unfortunately.

Josh Lee

So hopefully we are going to have a little bit drier, a little bit drier than we did in '25. But you know, just having enough season. And I know you mentioned about warmer season temperatures. So something to keep in mind. You know, we're planting, we're planting cotton or any other crop. You know, heat fuels growth. So that's definitely something to keep in mind.

Josh Lee

You know we've got these higher temperatures. We should have more rapid development, more rapid leaf development. So something to keep in mind. Obviously we want the moisture though. So you know before we get out there and we get the planters going to get everything, make sure to check your weather conditions. That's very, very key. You know, we need a, a good ideal temperature, you

know, to check and make sure we're not dipping below, too cool of a temperature at night. Make sure we have a good, moisture level in the in the ground that we're planting in to get moisture and make sure that we're not in any waterlogged conditions.

Josh Lee

You know, that can affect you know, how much oxygen is available in that soil compound, and they can actually have water-logging. So, just some planting facts to keep in mind and we're going to talk more about planting, and you know, getting ready for that in our future podcast. But you know, it's always something to keep in mind keeping, you know, as we make these management decisions as we go into the '26 season.

Chandler Gruener

So yeah, that's kind of interesting talking about the spring weather. So we just had on the news a couple of weeks ago, Sand Mountain Sam is our opossum here in North Alabama that comes out and he predicts. And so we he predicted we have an early spring. And so it's good to hear that from a climatologist that, you know there's some basis on kind of what they're doing.

Chandler Gruener

He kind of went against what Punxsutawney Phil had of more winter. But you know, he's our Southern version. So maybe he was closer this year being warmer temperatures and having that warm spring. But he doesn't tell us that whether it's going to rain or when to plant. So it's good to have you on today. And so is there any other items you'd like to cover, David?

David Zierden

Yeah, just, you know, I talked about a lot about this El Nino-La Nina cycle and also longer-term trends. But weather is still going to happen. 1 or 2 events can change the whole balance. Like I said, this winter was forecast to be warmer than normal. But we've had these disruptions in the polar vortex that that skewed everything.

David Zierden

So that the El Nino-La Nina cycle explains maybe 20% of the variability. So there's a lot that we can't really get a handle on. So, have a really trusted, source of weather information. I trust the National Weather Service. But, yeah, I don't need to. I'm preaching to the choir about keeping your eye on the weather and having great, great resources to reference it and plan your, your decisions.

Chandler Gruener

Yeah. Using a quality source of information. Just a possum popping out of a hole to kind of pick your weather patterns.

David Zierden

Exactly.

Chandler Gruener

Yeah. That's a it was a fun thing to see, but it's good to know. And then it's kind of exciting. Like you're talking about the switching to El Nino in the fall. So like I work in the realm of soil health and cover crops. And so if we're predicting a little bit wetter falls, that'd be good news for cover crop growers. I know last fall was kind of a little bit rough, was very dry.

Chandler Gruener

We didn't get the rains. And then as soon as we get a little bit of moisture, we start growing. Then we have these real cold snaps lower than kind of normals or averages. So that's good news to hear that we're kind of switching into like a little bit of a warmer cycle. And then having that be consistent with a little bit of moisture, we could actually get some good cover crop biomass compared to this year.

Chandler Gruener

We had some weird frost issues that came in different times.

David Zierden

Yeah.

Brenda Ortiz

So one final question, David. Minimum temperatures. So you mentioned that, you know, we have been experiencing in the summer, you know, higher temperatures, than compared to the average. How that pattern is impacting minimum temperatures, because we know that does it very important for plant transpiration. So what can you tell us about minimum temperatures.

Brenda Ortiz

What are the trends? What can we expect?

David Zierden

You know, that's a great point is I've talked about the general warming trend. The southeast and especially the northern Gulf Coast, Florida has been experiencing in the last, 15, 20 years. The, a bigger

driver of that trend is the overnight temperatures. The overnight minimum temperatures are warming more than the daytime high temperatures. So, you know, I don't I'm not an expert.

David Zierden

I don't know how that, affects crop physiology or anything like that, but I know it leads to higher soil temperatures. The soil temperatures don't cool off and recover at night. And so that is a concern as we continue to see this warming trend, especially in the summer months. And it's more in the overnight minimum temperatures than in the daytime high temperatures.

Josh Lee

Yeah, there's actually some research going on in the in the Cotton Belt on elevated nighttime temperature.s So definitely something to to keep in mind that research is still going on. So I won't talk about it here. But definitely that work is being done.

David Zierden

So I'd love to see it when it's done. Absolutely.

Josh Lee

Oh yeah. It's interesting work. I know the crew that's working on it. They, they're working very hard. It's a it's a very interesting project and hopefully it'll come to kind of publication here in the next year or so.

David Zierden

Well, the question for you is, I know, the, cotton industry, they're always trying to develop new and better varieties. Are they trying to develop more heat tolerant varieties? Is that on their plate? Is that being is that research being done?

Josh Lee

Yeah. So that that research is actually being conducted, you know, here in the, here in the southeast, we're not as concerned about the elevated nighttime temperatures as much as our counterparts in the southwest region, you know, like Arizona, New Mexico, Texas, High Plains, you know, they deal with more of those issues than we do. And there's a good bit of research on heat tolerance work on different cotton varieties.

Josh Lee

So that work is being done. Currently, here in the Southeast, you know, we've got, you know, we're it's kind of a blessing and a curse. We do have a lot of humidity. So that kind of plays a role into this. What

we're kind of concerned about, kind of, what research is kind of looking at is we're kind of looking at retention here in these with these elevated nighttime temperatures and seeing if retention and that kind of stuff in boll development is affected.

Josh Lee

And again, that's why these research researchers are working in the Southeast to try and better understand that. But you know, it's always harder to do research when it's pitch black dark than in the middle of the day, you know, at 95. So something to keep in mind. But that's what I'm going to go with here.

David Zierden

Okay.

Chandler Gruener

Sounds good. Well, I'd like to thank our guest today, David Zierden, Florida State Climatologist. He's with Florida State University. Thank you for joining us today. And thank you in the room with me today, Josh and Brenda, for joining, asking questions. And that'll be all for the Alabama Crops report podcast.

David Zierden

All right. Thank you very much. It was great to join you guys.

Josh Lee

Thank you, David.

Announcer:

The Alabama Crops Report is a production of the Alabama Cooperative Extension System.