Speaker 1 (00:00):

In this episode of Tim Talk, we address climate change. Our guests include a climate scientist who's traveled to the ends of the earth and a pair of Bangor High School students with a real passion for this subject.

Speaker 2 (<u>00:15</u>):

Greetings, dear listeners, you of course know that we celebrated Earth Day about a week and a half ago. And in keeping with that theme, our focus for this podcast is climate change. So you might be asking yourselves, what does climate change have to do with medical and social justice? Which of course is the, uh, basis of these podcasts. I have some guests who will help to put all of that into perspective, some wonderful guests with me here today. And I have three that I'm gonna introduce to you. Our first guest, Dr. Paul Majewski, is director and professor of the Climate Change Institute at the University of Maine, and distinguished professor in the schools of Earth and Climate Sciences, Marine Sciences, policy and International Affairs, and the Business School and Law School. He also is an internationally acclaimed glaciologist, climate scientist and Polar explorer. He is the leader of 66 0 expeditions to some of the most remote reaches of the planet, including Antarctica. He has more than 475 scientific publications and two very popular books, one the Ice Chronicles and two Journey Into Climate. Paul, I shared all of those outstanding credentials and experiences to give our listeners a sense of your life's work and what an incredible life's work. And I would like to give you an opportunity to expand on the introduction I just shared and describe your biggest interest these days in climate change and health.

Speaker 3 (<u>01:56</u>):

Tim, thank you for the opportunity to be here. I've been working in climate change for several decades, uh, and it really was not until about five or 10 years ago that people began to realize that this is not just a matter of what the temperature will be by 2100, but there are an awful lot of things affected by the temperature. There are an awful lot of things that are related to the emission of greenhouse gases, and one of the big, uh, common factors that's related to all of those is health. People obviously care about their relationships with their families and friends. They care about next probably their health, and then after that, their wealth. All three of those. But in particular, health is greatly impacted by climate change. Everything from warming to drought, to vector borne diseases, uh, to the fact that peop some people are in terrible situations because of sea level rise or storms. These are all ways in which our health is impacted. So, uh, I believe that climate change is the biggest security issue of our century.

Speaker 2 (03:06):

That's wonderful. And you know, that is so true when I reflect on that, that five to 10 years ago is when we started to hear a, you know, a a bit more about what you've been studying. Many people have been studying for a long time. I was just hearing yesterday on a business oriented, uh, radio cast, that that's really the environment impact is what's driving so much of the global economy right now, that new innovations and, and new developments as well as redesigning and even recovering from those industries that are really devastated by global warming and the likes. So we're beginning to hear more about the health impact, as you just said, and I don't think, uh, that we as a society have really made that connection that much, but we've really gotta do that. And, and that's what Northern Light Health is here to do, is to help with that as well.

Speaker 2 (03:58):

So thank you for that. So, as climate change is a concern, as we just, were stating very much presently, but also future generations will need to address this too, of course. And I love the passion that I'm hearing from, uh, the next generation and our two guests, and I'm gonna introduce are really gonna let you know that. But, um, it's, uh, it's in my family as well. A lot of my, my children and others are, are very much, um, talking about this a lot. So we wanted to invite some younger people who are passionate about this issue onto this show. So first, let me introduce Carly Hayward. Carly is a senior at Bangore High School and cares deeply about the environment and the impact on human health. She presented her research on biodiversity and food security at the regional Northern New England Science and Humanities Symposium in New Hampshire in early March, and as presented at the main state science fair on April 1st and award-winning. I might add. Thank you for joining us, Carly. And I would like to ask you what asked Paul describe your biggest interest these days in climate change and health?

Speaker 4 (<u>05:15</u>):

Thank you for having me here. Uh, Tim, I think that Paul couldn't have put it any better. The changing climate is a huge problem for my future generation, and it's something I am really passionate about creating solutions too. So in the future, I plan to study chemical engineering and environmental science at Humane to continue on my research, um, and continue learning and expanding and solving problems.

Speaker 2 (05:43):

That's wonderful, Carly, thank you for that. Really glad that, um, you've gained this experience so much as, as a maner and you're gonna continue to do that. So that's really wonderful to hear that and know that. And listeners, I hope again, as I get ready to introduce our, our our next student, our next guest, um, that you pick up the fact that it's not only us, um, uh, that have been around for a bit like Paul and I, uh, it's, it's our next generation that I just get very excited about hearing your perspectives on. So thank you for that, Carly. More to come. Our next student is Alex Basco. Alex is a sophomore at Bangalore High School and a member of the Bangor High School STEM Academy. He was a top 300 finalist in the national, I underscore, national Broadcom Master's competition for middle school in 2021 for some of his solutions and ideas about microplastics. In 2022, he won the main Stockholm Junior Water Prize and represented the state at the National Stockholm Junior Water Prize ceremony. He also presented his work at Northern New England Junior Science and Humanities Symposium, and as presented at the main state science fair and also award-winning just like Carly Alex, it's nice to have you join us and please describe your biggest interests these days in climate change and health.

Speaker 5 (07:15):

Uh, thank you. I'm happy to be here and I believe that the two speakers before me have really hit the nail on the head about climate change. Not only is it a developing issue, but for people my age, especially, you know, myself and Carly and all of my classmates, this is an issue that our generation is going to have to face the repercussions of. So that is certainly one of the motivations for my work, which is concerned about the environment and how we can correct, uh, the downward spiral that we're in.

Speaker 2 (<u>07:45</u>):

Wonderful. Thank you for sharing that. Alex Paul, back to you. Your work has brought you to some of the remotest parts of the globe as our introductions noted, what has that work revealed to you about climate change and its impact on the planet?

Speaker 3 (08:02):

We've been working in these ver very remote areas, and when I say we, I mean fellow faculty and many of our students, undergraduate and graduate students for, for decades have taken hundreds of students into remote areas. And the purpose was to see if we could find ways in which we could un better understand how the world is changing perspective. Uh, and the way you gain perspective is by looking to the past to see where you are today. And that's been one of the big goals of our institute. As it turns out, ice, uh, is a particularly good, uh, sentinel for climate change, uh, small change in temperature, and all of a sudden you can lose sea ice for the entire summer in the Arctic, which is what's going on right now, which has had implications for the entire northern hemisphere. At the same time we've gotten to meet indigenous people all over the world, uh, we've learned that their culture, uh, has actually reacted extremely well to environmental change in the past.

Speaker 3 (<u>09:05</u>):

There's plenty to learn from other people outside of our own country and within our country in visiting these places. We've also seen people who live in very dire situations who are right on the edge when it comes to environmental and climate change. We're very fortunate in this country, many of us, not all of us, to be able to, uh, be sheltered, to have, uh, heating in the case of Maine, not necessarily very much air conditioning, which is going to be very important in the future. This is not the case for everybody. Uh, and as a consequence, you become certainly much more empathetic about the way others live, and you have a realization of what it might be when you begin to experience change. And that's where we are right now. We are beginning to experience very fast change. We discovered about 30 years ago, the fact that the climate doesn't have to change slowly, it can change faster than a political cycle.

Speaker 3 (<u>10:04</u>):

And that's exactly what's happened in the last few years. Uh, people talk about a new norm. That new norm in, uh, is absolute increase in the instability of climate. It's very hard to predict what will happen, uh, over the next couple of weeks and, and the next few years. There are big challenges because we do need to understand that. So traveling ov all over the world, throughout the United States, north America, uh, on our expeditions has been a very important opportunity for us to reach out farther than our, the comfort of our homes, uh, and realize that there are a lot of things that are going on out there that impact us. And climate change is clearly one of the most important.

Speaker 2 (10:45):

Wonderful. Thank you, Paul. You know what, um, a big takeaway that I had from listening to that is you, you didn't quote statistics, quote science quote studies, things like that. You, you talked about the impact on people and what you've learned from people, and that we all have a lot to learn, uh, from people that are experiencing this. And I think that's a very important takeaway, um, and something we're gonna hear more about in the, the rest of this, uh, podcast. So thank you very much for that. I'd like to now, uh, invite our students, our, my guests, Carly and Alex into the conversation. Carly, I understand you've done some research into green crabs in Maine. And first of all, I have to digress. I grew up in the mid-Atlantic area around the Chesapeake Bay area, and, um, blue crabs were the big deal there. So I'm not sure what the difference between blue and green crabs are. Um, maybe not much when you have them on a table and they've been steamed up. I'm not sure. Anyway, green crabs in Maine. So Carly, can you tell us about your project and how it ties into climate change? Yeah,

Speaker 4 (<u>11:53</u>):

So I researched European green crabs and looked at the color of the green crab shells and found that the crabs have actually been able to adapt to match the color of the seaweed at individual habitat locations along the coast of Maine. And we performed our research and found this through the use of computer technology and multi-spectral imaging and then statistical tests and being able to understand the ways in which they adapt in terms of color allows us to understand the ways in which they'll adapt in the future and further provides us, um, understanding of their success when they newly invade an area. And the changing climate does tie into the success of green crabs because they are able to withstand a wide range of temperatures in salinities, which allows them to be so successful in different areas. And then with the changing, um, oceans with changing temperatures that are rising and the salinities also changing, it only gives them the upper hand to survive.

Speaker 4 (12:52):

Um, and they do have severe negative impacts on Maine's intertidal bio biodiversity. They decimate clam flats and, uh, juvenile lobster and crab, and they overlap habitat with that of native species. So with their success only, um, further herz Maine's, um, intertidal biodiversity, and it will with the future changing of our climate, but if we can find solutions and ways to use the green crabs to our advantage, um, and maybe create an industry out of them so that Maine, um, Maine's economy will, will be further helped as well as the, um, the intertidal biodiversity, like the, the clams will only be helped, which will also help that industry as well. I think we can find solutions that are good for, uh, the marine life as well as people in Maine. And I think looking at those, those future, um, solutions is gonna be crucial in the future. So yeah.

Speaker 2 (<u>13:51</u>):

Carly, that's fabulous. Thank you so much. And I hope, um, uh, my listeners replay that and listen to it again. Um, I love the, the knowledge, I love the passion of the use of technology. I love everything that you just said was really fascinating. Thank you. Thank you for sharing that. Alex, tell us about your research into microplastics.

Speaker 5 (14:12):

Yes, thank you. So my research on microplastics has been kind of a three year long study so far, and I like to break down my years into year one. What are microplastics? So I looked at microplastics in bottled water, and I was looking for some sort of correlation between bottle size and microplastic contamination. Ultimately, I did not really find a correlation, but my big conclusion from that research was that microplastics in water is a major issue. And so that brought me to last year's research where I like to describe it as how are microplastics from water? I did a lot of research into the ways in which microplastics are currently removed from water, and I ultimately stumbled upon a very interesting method that was kind of in its early stages of development. So I worked some with that method and I turned that into a project.

Speaker 5 (15:08):

And then my, this year project, I would say that it was, how can I remove microplastics from water? So I worked to develop a method, a filter that can be used to remove microplastics from water using vegetable oil. And my main focus on microplastics, kind of the reason that I got into this research, I would say that it has two key points. So the first point is these clean water. Clean water is a concern for everyone. Everyone should have a right to clean water. And so now that water is being found to have a lot of microplastic contamination, microplastic removal techniques is a very high, uh, interest point for

me and for scientists around the world. And so that's one of my primary motivators. And then my second motivation for this work is that microplastics in water indirectly relate to climate change because the microplastics affect the ocean's ability to absorb carbon dioxide. And so that while it's not an apparent issue, is actually something that is very much happening below the surface. And so that's why I have been studying for the past three years, microplastics in water and working to develop ways that I can remove them to help clean up our oceans. Thank you.

Speaker 2 (16:32):

Thank you so much for that. Alex. Uh, you know, uh, listeners, Alex just, uh, was talking about how can not only the, this, the science and technology of, of everything that goes into researching into this, but how can I remove microplastics from water? He said that sentence. So he made it personal. Carly made it personal. She was drawing the connection between green crabs and people. That was the last comment that she made as well. So I hope you all are, are, um, really picking up these kinds of takeaways from, um, our future from people that are, are really our future. Paul, what do you think of these students in the, what they've shared so far in the work that they're doing?

Speaker 3 (<u>17:16</u>):

Tim, you mentioned a word early on before you ask, uh, Carly and Alex questions, and that was, uh, passion. And both of these students have a great deal of passion for what they're doing. In addition to that, they have a lot of very creative ideas. Carly is studying something that's particularly important to the marine environment and places like Maine along the entire East Coast. And whether you continue to look at green crabs forever or spread out even more, uh, obviously you have a great interest in it. And, and that's important. Uh, and that's exactly what will probably drive you through your career. Uh, Alex has picked up on microplastics, uh, which is obviously is an immense issue also for the ocean, for the land. We know that, uh, microplastics are appearing in our blood, uh, in, in all of the foods that we eat. And it's extremely important that people take these issues personally as you're doing, uh, so that you can make a contribution. They're great opportunities. This is, yes, to a large degree, it's trying to solve very important problems that are in effect crippling us in many ways. But on the other hand, it's a great opportunity, uh, to make not only a substantial contribution to society, but also to find new ways to live.

Speaker 2 (<u>18:40</u>):

So true. That's great, great impression. I share that with you as well. You know, Paul, at the beginning of the podcast, I promised our audience that we would explain how climate change plays a role in medical and social justice. And in speaking with you, I know your research shows how climate change disproportionately affects the health of vulnerable populations, especially, and you just mentioned that a few minutes ago as well. So would you please elaborate for our listeners on that point?

Speaker 3 (<u>19:12</u>):

Thank you, Tim. Uh, climate change, uh, as I, as I mentioned before, is the perhaps greatest challenge of the 21st century. Uh, it permeates absolutely everything that we do. And if we start first with vulnerable populations, tremendous, uh, food insecurity, which not only leads to starvation, but obviously to, uh, to all other health issues that people are, are going to be susceptible to. Uh, in addition, there are parts of the world where sea levels rising and where crops can no longer be grown because they're being, uh, changed as a consequence of salt intrusion. Uh, forest fires, uh, that are making people migrate. Uh, during the Middle East crisis, they were on the order of 30 to 40 million people who were considered to be refugees. As a consequence of that, the estimate for climate refugees is in the hundreds of millions. A

place like Maine, which is a particularly nice place to live, and a changing climate, that isn't to say we don't have our own issues like ticks, uh, will, I believe double in population in the not too distant future.

Speaker 3 (<u>20:23</u>):

And that means that in terms of schools, healthcare, there's a lot for us to plan for in the future. So there's a lot to be learned from seeing what goes on in the rest of the world with vulnerable populations. I believe it's our obligation, uh, as a very powerful and wealthy country to be doing more for these vulnerable people in our own country, uh, and in other countries. And then I'll end with one other really big thing. Uh, if you are living in a, a, a well-healed society, you can eat good food, you can drink clean water. What you cannot do is escape bad air quality. 7 million people a year die from poor air quality. That's one in 10 deaths prematurely as a consequence, along with greenhouse gas emissions, we're also emitting cadmium, which can lead to autism in young children, we're emitting things like lead in the air and also in the water, which has tremendous impacts, including Alzheimer, uh, potential cause of Alzheimer's disease.

Speaker 3 (21:27):

So we need to think carefully about our air quality. And during nine 11 and more recently during Covid, uh, when we began to see few, uh, less traffic, air traffic, land traffic, industrial activity, uh, air quality increased very, very fast. This is the one thing, uh, that we could do very quickly that would dramatically improve our health. Uh, if you go to, uh, remote vulnerable populations, their air quality, if they're in very remote areas, is pretty good. However, they have terrible indoor air quality because they are not able to ventilate the cooking systems that they use. If you go to population, large scale populations in other parts of the world, they have terrible air quality. And as a consequence, people die much earlier. Uh, and there's tremendous amount of, uh, respiratory disease. Health, as you know, better than I do, is one of the, if not the biggest issue, uh, in our country, uh, access to it cost, et cetera. Getting those things under control, learning how we can do a better job looking at other countries to see how they do this. We're a very advanced country in terms of medical technology, but we need to do a better job in terms of access. Uh, and climate change only makes this entire situation that's that much more critical.

Speaker 2 (22:51):

Thank you. Thank you, Paul. And access and quality, you're absolutely right. That's what we look at all the time in Northern White Health. And we're very, um, assertive into, um, uh, recruiting people, uh, to Maine because, uh, we know that the workforce in Maine, numbers wise isn't, uh, sufficient. So, um, things like, um, are very proactive, uh, position and taking actions, uh, on along the lines of global warming. And, you know, healthcare has a, I believe 9% of the, uh, of the contribution, overall contribution of carbon dioxide is the latest study that I saw and, and heard. And we take that seriously, and we think that that's a good way to attract and retain people here too, because the next generation cares passionately about that as we're hearing today. Speaking of which, back to you, Alex and Carly. I know this is a weighty question for young people, but you, neither one of you seem intimidated by weighty questions. So I'd like to know if you have given any thought to the role that addressing climate change can play in improving health for all pop all people in the population, especially the most vulnerable.

Speaker 4 (24:10):

Um, yeah. So to start with kind of my research on green crabs, much of my family is from the down east main area, Macias, and you see a lot of people rely on the fishing industry in that area for their income,

their livelihood, and with, uh, for example, the invasion of green crabs and the decimation of clam flats that negatively impacts the, the industry. Um, and it also negatively impacts the livelihood of those re that rely on the industry as well as, uh, creates further food insecurity. Um, uh, and in areas where, uh, that are less, um, less developed, they, they do truly rely on the fishing industries more so than we do in, in Maine because we have, we have other sources of food, but it is also huge in Maine as well. So seeing these, these impacts not only, um, impact the well-to-do people, but also the people that rely on these industries for their income and their livelihood. And then also with food insecurity comes, uh, comes health effects on all people. So it really, my research as well as many other aspects of climate change does, does tie into human health.

Speaker 2 (25:27):

Thank you. Carly, how about you, Alex?

Speaker 5 (25:29):

Yeah, so Paul mentioned it earlier, but microplastics are being found in human blood. So the more microplastics that are entering the waters and that are then consumed by fish, which are then consumed by us, the more likely it is that we are going to end up with microplastics in us. And while the effects of microplastics are not completely understood, they're certainly concern that you are consuming things that are not meant to be consumed. And this is an issue for everyone. Everyone is, everyone relies on fish and other animals that are inevitably consuming these plastics for their own, uh, consumption. And so as more microplastics are entering, you know, the oceans and are being consumed by more fish, then this turns to everyone will be affected by this issue. And this is certainly an issue not just for microplastics, but for climate change in general, where we know some of the effects of what this is doing to us. But one of my personally biggest fears is what do we not know about how this is affecting us? And so that's true for climate change. There are ways that we probably don't even understand yet that we as a population will be affected by climate change. But then also zeroing in on my research, how will microplastics be found to affect us? And so that's certainly why I'm very concerned about microplastics and climate change in general, and what I can do to help mitigate my contribution as well as our, uh, contribution as a whole.

Speaker 2 (27:13):

Very good. Thank you so much for that both of you. Um, I wonder, Alex and Carly, uh, as we begin to, uh, bring this to a close, uh, do you have any questions for Paul?

Speaker 4 (27:25):

As we are, we're both young, you're turning into young adults who are going to probably go out into the fields of science and continue on research, but as young adults, do you have any advice for what we can do further, um, and for other people in our generation to take action and, uh, combat climate change?

Speaker 3 (<u>27:45</u>):

That's an excellent question, and it's really great to hear that you're thinking about including other people, uh, your peers and, and what you're doing. Uh, in Maine, we're very lucky. There are tons of grassroots, uh, organizations which are very interested in the environment. Um, and I think that, uh, you no doubt have those sorts of things in, in your school right now. So, uh, providing a model for, uh, for your passion, uh, for what you think is the value of what you're doing is, is certainly an important thing for you to do.

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Speaker 4 (28:20):

Okay, thank you.

Speaker 5 (28:22):

And I had a question. I am wondering about what the interest level is in climate change, especially in young people around the world. I know certainly that it's a big concern for people in my school, in my state, but I'm wondering what you have seen in all the places that you've been to.

Speaker 3 (28:41):

That's a very good question, uh, Alex, and, and I think the answer is that, um, certainly, uh, literally every country I've gone to, the people not only understand that climate change is an important issue, uh, but it's not something that they even needed to be taught. It's something that they just plain understood. Uh, unfortunately, uh, in our country, Europe, other countries, this issue in many others have become politicized. This is not a political issue, it's a matter of facts. Uh, and understanding how to present those facts, uh, not necessarily as numbers, but as things that actually relate to people, is extremely important.

Speaker 5 (29:29):

Great. Thank you so much. And I definitely found that interesting about the human side of your, uh, your interest, because that's certainly something that I've been taught is that there's a number side to everything, but then there's also the personal impact, and that is something that's very important to get your message across. So thank you very much.

Speaker 2 (29:50):

Terrific. Thank you all very much. And, you know, to keep with the dialogue is really fascinating. Listening to the, the three of you speak with each other. Paul, do you have anything you'd like to know also from Alex and Carly or any final words of advice?

Speaker 3 (30:06):

Well, to start with a little bit of advice, actually, not advice, just commentary. You've been very fortunate in the schools that you've been in because you have teachers who've been very supportive of what you've done. You've had, uh, you've had great opportunities and, uh, I know that you're both very interested in sharing those with other people, uh, particularly your peer uh, your peer groups. Uh, and you have a tremendous drive to solve problems, all of which is wonderful. Um, how do you see in the near future, even with, with within college, once you get out of college, whether you go to grad school or not, whatever you do, uh, what do you think you want to learn, uh, and where do you think you would like to learn it? Not necessarily a particular place, but where might you go to learn more about what you are passionate about and how you can be effective?

Speaker 4 (<u>30:59</u>):

Um, so to, to jump in, um, I'll be heading into college, but I, I really do want to continue taking advantage of all the opportunities I get to actually go out into research fields and see hands on what's, what's happening in ways in which I can solve these problems. And I think also, um, a big part of this might be, uh, there's a lot of things in Maine that we can, we can solve right here, but also traveling to other areas and seeing the ways in which the climate's affecting all areas in, um, what kind of larger

scale. Seeing, seeing these problems and solve, trying to find solutions is probably where I, I would like to see myself going and how I'd like to see myself, uh, getting into the field and hands on solving problems. Thank you.

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Speaker 5 (31:45):
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Yes. And sort of similar to Carly, I think that in order to continue my drive to keep doing this, there's definitely the aspect of going out and seeing the actual impacts of what is happening. And that will be enough of a motivation to inspire me to come back to say, my college, where I've got access to a bunch of different resources that can be used to help address the issues that I saw out in the field.

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Speaker 3 (32:13):
Excellent responses. Thank you. Thank
Speaker 4 (32:15):
You.
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Terrific. So, Carly, Alex, Paul, thank you so much for this fascinating conversation. And listeners, this is why I feel like I have the best job in the world because, um, I could feel it here in the room. And I just hope you, um, also feel the positive vibes and the hopefulness, um, that was expressed today by our three, um, guests. So thank you so much. As we're wrapping up, I'd like to also, um, you know, give a real shout out to our northern Light health climate health team and this team, it's a hundred people from, uh, you know, south Portland to north of Pres Isle, and many places in between. And we offered, we opened this up, we said, you know, we want to have a, a climate health team. And so we opened that up and, uh, there are a lot of people that are working on that right now and really taking our responsibility to do something about a carbon footprint, um, very, very seriously.

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Speaker 2 (33:24):
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Speaker 2 (<u>32:16</u>):

So they're doing great work to help us reduce our carbon footprint through facilities improvements, investments and electric vehicles and education and awareness. And by the way, our, our two new hospitals that we're building in Greenville and in Blue Hill, um, replacing 100 year old hospitals, you can imagine how, um, outdated and carbon heavy, those 100 year old facilities are. And, and they're being replaced in a, a very responsible way. It's gonna be a very interesting, a lot of fun, um, investments in electric vehicles. You might have seen those around town with our pharmacy and other, um, uh, supply delivery and education and awareness. In fact, recently our organization, it's really in the top quartile, as I heard of health systems from around the country have committed to reducing 50% of our admissions by 2030 and achieve net zero emissions by 2050. So Paul, Alex Carley, it's been just a grand pleasure for me to have you on our show. Thank you for being here.

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Speaker 6 (34:32):
Thank you for having us. Thank you
Speaker 2 (34:33):
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So much. Thank you. Great. And thank you to our podcast listeners too. Until next time, this is Tim Gentry encouraging you to listen and act to promote our culture of caring, diversity, inclusion that starts with caring for one another. Thank you.

Speaker 1 (<u>34:49</u>):

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