



# Library podcast

## Lynda V. Mapes discusses Witness Tree

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[00:00:30] Good evening. Hi everybody. I'm Stesha Brandon. I'm the Literature and Humanities Program Manager here at Seattle Public Library. Welcome to the Central Library. And to tonight's event with Lynda Mapes and Florangela Davila I'm delighted that tonight's event is being presented in partnership with the Elizabeth C. Miller Library at the University of Washington Botanic Gardens and the School of Environmental and forest sciences at the College of the environment at the University of Washington. I would also like to thank our author series sponsor Gary Kunis and the Seattle Times for their generous support for library programs. We're also grateful to the Seattle Public Library Foundation private gifts to the foundation from thousands of donors help the library to provide free programs and services that touch the lives of everybody in our community. Now let me turn the podium over to Karen Maeda Allman from Elliott Bay Book Company to introduce the rest of the program

[00:01:28] Good evening and thank you so much for coming out tonight. Nature lovers book lovers and especially tree lovers I want to acknowledge that there are many many people in this audience who are. Seattle Times reporters photographers television reporters and also part of our community in so many ways covering the environment and also those of you who like me read this. It's all really important work that you're doing. I'd like to acknowledge that Lynda Mapes work appears in The Seattle Times just about every day and I always look for what she has written so Lynda Mapes is the environmental reporter at The Seattle Times where she specializes in coverage of the Environment Natural History and Native American tribes covering such diverse topics as the protests at Standing Rock the removal of the Elwha Dam. The effect of wildfires on Washington ranchers and also the fate of Rialto the order. Her previous books include breaking ground the Lower Elwha cloud tribe and the unearthing of say with Zen Village and also her book Elwha River reborn. And she spoke about both of those books right here at The Seattle Public Library and maybe some of you were here for that as well. So the writing of her new book which she is here to speak about today. Her new book is called Witness Tree seasons of change with a century old oak. This is published by Bloomsbury and today it's publication day. Yeah. Witness Tree was supported by a prestigious Knight Fellowship in science journalism at M.I.T. and also a Bullard fellowship in forest research and the oak that she's going to tell

us about must be one of the most studied trees on the planet. And who knew that this project. An extraordinary examination of the effects of global warming as told to the story of a single oak tree planted in the Harvard Forest a century ago.

[00:03:41] Who knew this would be such an intimate story telling a story as much about us and about our effects on the planet as about the tree and its immediate community and ecosystem. So tonight Lynda Mapes appears in conversation with Flora Angela Davila managing editor at crosscut and this is a new move for her and very exciting for crosscut readers which hopefully many of you are. Or will be. She is a veteran Seattle journalist who worked for 14 years as a staff reporter covering race immigration and features at the Seattle Times. She's also been a longtime contributor to Cayenne X K F M as it's now called and she served as the voices of the region director for Seattle nonprofit for Terra where she launched the ampersand program which there is a Ampersand print magazine and also she produced the ampersand live stage show. So I can't think of a better person to do this on stage interview. So with that thank you all for coming. I'd like to tell you that they're going to Lynda is going to speak for a bit. There's going to be an onstage conversation component. If you have questions about this book or about her other work you'll be invited to answer. Ask those questions as well. And she'll be signing her books afterwards at the front table. And we have copies of Witness Tree end of Ella actually for sale at the Elliott Bay Book table. On the other side. So thank you for coming. And please join me in welcoming Lynda Mapes and Florangela Davila

[00:05:24] Thank you so very much. What a wonderful site to look at and see so many friends and it's just a joy to be here. How's the sound. Yeah not too loud. It's okay. All right. I want to say just a few thank you's to my husband Doug Macdonald who's probably heard more about this tree than he ever wants to hear to my agent Elizabeth Wales. It's actually all started with her and I have so many thanks for Elizabeth. I want to thank the Seattle Times locally owned family owned since 1886. Thanks to my colleagues for supporting me throughout this project and for all the dear friends in the audience tonight. And thanks to the library for hosting. So with that Florian I are gonna talk for a little bit about the book and my discoveries out there at the Harvard Forest.

[00:06:22] I'm going to show you some pictures and I'm going to read a little bit and then it's your turn so it probably won't surprise you to know that Lynda Mapes is enormously curious about the world right. It comes across in all the stories. And this book really is about your curiosity and your observation about this magnificent tree. But it really dates back to you have a serious love affair with trees.

[00:06:51] And I was wondering if you could talk a little bit about how you open the book which is so personal and so intimate and it really as a reader it grabs you and you have to just sit down and read the book in one sitting because it is that special you know this was fun as a newspaper reporter to be able to walk onto the page as myself and be personal and talk about some of what I brought in my heart to this book. It goes all the way back to my childhood Flora is quite right. I grew up in a kingdom of trees. I was so lucky. My parents when I was five bought a place for the ramshackle house and a big stinking frog pond and seven acres of trees. What could be more glorious than that for a kid. And I had one of those glorious unmanaged childhoods my mother would say go outside and find

something to do and we'd build forts and dig holes and start fires and I had black eyes to Calma and lotion from head to toe and every photo and I felt so lucky for that childhood and a lot of it was all about trees getting in the firewood. We had three fireplaces we were always getting ready for winter. We were always enjoying our forest. And so it started early with me. And it certainly never left me.

[00:08:07] And the opening chapter also has you moving through a period of time. You return there's a moment when you return back to the tree and you really look at it as this. This friend you are on this quest to revisit this friendship and all of a sudden everything comes back. All the memories tree the tree has been there and it has. And you realize that it has been witnessing a lot of things while you've been gone this was so fortunate.

[00:08:36] You know my parents sold that place when I was in college and I never told them about the dreams I would have about the forest being cut down or development. What have you and Doug encouraged me to go back to my family home and forest. Many many many years later this was probably five years ago so I hadn't seen that place. And golly. Lots of years. I was afraid to go back but we did go back and the people who lived in the house now were away fortunately so I knew what I wanted I just wanted to go up into the woods. So we parked the car out of sight and we went right up the wagon road. Into the woods and there they were my childhood friends still there still intact. The very same trees and I can remember touching them and yes hugging them and thinking it was a moment too kind for this world. You know and that's what it is about trees. They outlive us. They're here before we come onto this earth. They're here after we go. They hold our stories. They hold our hopes our dreams. Trees are our oldest traveling companions and they as a matter of fact. Help enable life on Earth with the oxygen they create. We have a very special bond with trees so that's how the book opens.

[00:09:55] She has a special bond with this tree that's in upstate New York. Yes and she then is in Harvard at Harvard and she is searching for a particular tree in terms of its size and its history. And she's really looking for a protagonist and she ends up telling us a little bit about why she picks the oak and what and what I love is there is a line that if an oak were an animal it would be a dog. So can you explain a little bit about for those of us who can't tell an elm from a pine from an oak. Can you tell us a little bit about an oak what the significance is and why you picked that particular.

[00:10:39] So first of all that's the tree right there that is that tree. I took that photo with an iPhone. It's just one of those miraculous godly photos that can happen sometimes and I wanted this tree in particular for several reasons. I wanted an oak because Oak is the most common species in the northern hemisphere. So everyone's got a favorite. Everyone knows this tree. Indeed if it were an animal it would be a dog that is just a very common everyday tree.

[00:11:05] And it's also a very useful tree. Furniture ships. I mean people have always turned to Oak for construction because it is so strong and so sturdy oaks are also incredibly beautiful. They they grow these fantastic broad canopies. If we leave them alone they will abide for hundreds and hundreds of years. They feed a broad suite of life more than 100 vertebrate animals eat the acorns that these trees will put on not every year but when they do put out a mast year that's when there's a

lot of acorns it's a fiesta in the forest and everything responds to the feast that's been put out for them. And so these trees oak trees in particular have a connection with people culturally because we've used them in so many ways for so many years and they're just so common. I wanted a tree that people knew I also needed a tree with some age. This tree is about 100 years old and I needed that because I wanted it to tell the story of our changing relationship with nature. I wanted it to tell the story of climate change. I wanted to make climate change personal. I was sick and tired as a reporter of telling the story in a way that people really didn't pay attention to. Parts Per Million doing politicians. I was sick of it so I figured readers were sick of it. I wanted to take the testimony of the quietness of the natural world to go out and look at living things and see how climate change was affecting the landscape. You know this as hikers as birders you can trust your intuition you can trust what you see and you know this isn't about whether Scott Pruitt believes in climate change we know it to be true it's an observable physical fact. And I wanted a tree that was old enough to tell that story about how our relationship with nature has changed and how the landscape is responding to climate change. So it had to be big. It had to be old and I wanted an oak. So we actually auditioned trees.

[00:13:17] There was a a wonderful collaborator in my project at the Harvard Forest. His name was John O'Keefe and he looked a little bit like an igloo.

[00:13:24] Yeah. Just the right white man. Professor Hare and John had been walking the circuit of the same 50 trees for twenty five years and making with his little number 2.5 pencil very hyper local notes of planetary importance. What he was seeing as he watched those same trees over all that time was how their seasonal timing had shifted because of climate change. You know this the seasons aren't what they used to be. Spring is earlier fall is later. Winter is getting squeezed on both ends in the living world is responding to this. The canopy leaves the timing of when they come out. The timing of when they color and when they drop had changed and John had been observing this meticulously year by year.

[00:14:14] And so when I got this fellowship at the Harvard Forest I said John I need a tree. This one of my stranger emails that I've ever written. And he agreed to let me go out on his walks with him and observe what he was observing in the forest and he helped me pick this tree. We started out with a striped maple which was very pretty but not big enough. There was a fantastic honey locust tree but it just was the oldest tree in the Harvard Forest. But it was a little too odd as a species. And then we came up to this tree and he put his hand on it and he said here. This might be a good one for you. So there it is. We caught it to confirm its age. These are micro cores tiny enough to fit inside a drinking straw and look at under a microscope and count the rings. And so we knew that it was old enough so that became the tree.

[00:15:12] We see it we see the tree from standing and looking up. And this really becomes an exploration of Lynda trying to connect with this tree in every way imaginable. She can you talk a little bit about how you connect with the tree and also this notion of the tree soirees that you ended up doing for the year so there's this children's book.

[00:15:34] And I'm hoping that people know it it's called In the forest by Marie Hall Ets. It's. In this book. A child starts off in a walk in the forest and gradually meets one animal after another that joins it in a little parade through the woods. That basically was me. I got to know a whole different kind of reporting doing this book instead of press releases and press conferences and these sort of quote unquote event driven narrative paces.

[00:16:07] I took my cues from the seasons from nature itself and from these scientists who had an entree for me into the forest and how it ticks. And I started holding what I called Trees Suarez bringing all sorts of different experts to the tree just to see how they would encounter it. What did they see. What did they know. So I took a carpenter. I took a Dendrologist, the people who know how to read the history of a tree in its core. You can actually see with a really tiny ring that was a tough year for the tree. And then you can look in other kinds of records farmer's journals trees stand records Oh that was the year of the gypsy moth attack or oh it was a drought that year a tree ring is one of our earliest historians. It tells you what happened in that landscape and there are people who know how to read these. Or we examined the tree with Dendrologist and I brought people who knew how to dig into the soil and discern this incredible web of life out of sight in the soil. Micah Ryssdal fungi providing a whole second root system for the tree this incredible diversity of life down there it's all going on down there. Parasitism mutualism communication you bet. I mean it's it looks quiet out there. It's not quiet. I mean for instance if a tree comes under attack in the spring on those lovely luscious delicious new leaves that they send out a tree can actually change the chemistry of its leaves to become less palatable. Pretty smart. Not only that they can send out pheromones to call in predatory wasps that will eat those crunching munching caterpillars take them away be gone. You know we think of trees as just standing there anything but they're consummate diplomats negotiating mediating creating all sorts of relationships with all kinds of animals seen and unseen.

[00:18:11] I didn't know any of that until I got there and got to spend time in the tree not only on the ground but up in the crown what becomes really fun I think about the book is that you really quickly. I was reading the book and I was riding the bus from point A to point B and you keep looking at the city and how so much has changed and I think I was only probably 20 pages into the book and every little tree that I saw on the sidewalk I had so much respect for that tree and thinking Oh my God you have stayed here and everything else has changed. And I think that's what you do with this book is the witness tree becomes this this friend that has witnessed so much history. So can you set the stage a little bit about your particular tree and the history that you started uncovering as to how much it had actually witnessed how how different the landscape and and what had surrounded that tree in 100 years that you discovered.

[00:19:12] So it was so perfect about this tree was it sprouted by a stone wall in New England. And what those stone walls mean that those used to be farms it is always so hard isn't it to look at a landscape and see anything other than what's right in front of you. And understand that actually there were people there before you there were whole other societies and ways of life before what is right in front of you in this tree has been witness to some of the most dramatic landscape change that we've seen anywhere in our country as well as societal change. I mean of course it's only a hundred one hundred and fifteen years old so it doesn't go into deeper time but nonetheless it has seen a lot it

sprouted as a wild sprout in about 1905 just when model trees start rolling off the assembly line people start leaving these farms and pastures to go to the factories work and live in the cities creating the emissions that are changing our world. It is so interesting to remember that when this tree sprouted was just after the height of deforestation in New England I think about Thoreau in his cabin in Concord and we always think oh his pen with a pencil out there with all the animals in the trees hardly.

[00:20:29] He used to lament the just ferocious clearing of forests all around him. He would say thank God they can't cut down the clouds and he would lament the loss of what he called the nobler animals the bear the deer boy in his day. Nobody had seen a deer in a generation and the biggest thing around was a muskrat because the trees had all been cut down for agriculture so fast forward to today the six state area of New England is one of the great we rewilding and reforestation of our time. It is one of the great green hopes of the world the walk away from the farms as people went to make their living in other ways allowed the forests to come back and with the return of the trees have come the animals the bear the deer their back. And in some numbers so great in some places their virtual pest to people and in their lives never lived with so much wildlife. So this tree has been a witness to all of those changes but it's also been witness to the changes in our atmosphere.

[00:21:43] Used to be about 300 parts per million. Now. Four hundred. So right now there's more CO<sub>2</sub> in our atmosphere than any time in the last eight hundred thousand years. No human has ever breathed this atmosphere. And that's happened just in 1750 in the industrial revolution and you can see it in the tree. You can even see it in the processes of individual leaves on the underside of a leaf or the mouth through which leaves breathed. They're called the Stomata those mouths also speak truth about our changing world because my tree today is growing faster than any time since records started to be kept being kept at the Harvard Forest. Not only that. It's growing more efficiently it's using less water. The reason for that is there's so much CO<sub>2</sub> in the atmosphere it doesn't you have to open its mouth as wide to get the carbon it needs to photosynthesis size. I find that incredible that you can see a global forest like global warming all the way into the cellular function of individual leaves. Not only that but the leaves now can't even last as long as these supersized growing seasons. Those leaves are falling off while the weather is still fine. Fall is coming so late now that the leaves are done for the year they're shredded. They're finished. They're falling off. They can't even last as long as the seasons. The reason for that is their seasonal timing is still set to their ancestors to their ancient ancestors. They can't keep up with the new seasons that we have created. They're actually two seasons now. The seasons of evolutionary timing and living things and the seasons made by us you can see that in one tree. And so this tree was glorious and beautiful and watching it go through the Great gyre of the seasons the Pageant of the year was an incredible joy to me and yet it had troubling things to say that our world is already changing not far away in either space or time. But right here and right now how tall is your tree.

[00:24:02] What are some of that. What is seven dimensions and did and did you name your tree I call this stuff the baseball card the stats. I did not name my tree and that was quite deliberate. I wanted it to be its own sweet self its own wildlife. You know I didn't I didn't want to intrude on it that way. And you know trees by the way also oak trees anyway are both male and female at once. So

how would you pick a name. But in any event I didn't name it but it's quite big. It's about 80 feet high with a glorious crown spread of sixty five feet. And because it is forest grown it doesn't begin to get its branches until quite high up. Really not until I want to say 25 feet up and so. You know it wasn't long after I got there that I really realized it wasn't going to be enough to walk under this tree.

[00:24:56] I was going to want to climb it. You do.

[00:25:00] I did. I hired professional help for this. You know I thought I'm really going to get that good out of my health insurance. Let's put it to the test. But you know in Massachusetts they have these wonderful people called Tree wardens. I love that don't you picture them like the Lorax with a badge. Don't touch that tree.

[00:25:20] You know their job is to defend the trees in the public space but also to teach people about their trees and you know who the person is is as excited about trees as as they are and sometimes it's just a guy on the road department and he doesn't really care. Sometimes it's somebody like Melissa LeVangie she's the tree Warden for Petersham Massachusetts where I was. And she was she's a professional arborist and a professional tree climber and she and her sister Bear very aptly named taught me how to climb trees and this is done with ropes and harnesses and a million clip on things. And I noticed as Melissa was getting ready to go up. She had her blood type on her helmet.

[00:26:07] I guess that's handy. Anyway I was I was basically too stubborn to back out at that point.

[00:26:13] And it was so interesting because we started these climbs in November and so the leaves are mostly off the tree at that point. We climbed it again in the very deep deep cold of winter and then we finally climbed it again later in spring but still no leaves my triumphal final climb was in June and the tree was covered with this fluttering green gown and she was resplendent. And you know what the tree felt different in each of these seasons. Iron hard in winter I mean firm firm firm and then in the spring it was springy. It really was springy

[00:26:51] And all these animals and sounds of birds would talk to us up there and in the springtime a swallow tail butterfly just littered right by me.

[00:27:03] It was divine.

[00:27:06] What I'm sure a lot of you know is how descriptive how beautifully descriptive Lynda's writing is and how she just transports you in and really puts you there and and what I loved about this tree and I'm wondering if you could talk a little bit about how the forest smells don't you think a lot about the sights and you have these great descriptions of what it looks like but but talk touches a little bit about the sounds since that's one of the ways you open up the book is with the sound of the tree being caught and there's there's actually a tree expert I forget what his name is or what his profession is that they go quoting. She talks about the squeaks that the tree makes but talk a little bit about the sounds of the forest but also the smells of the forest and the tree.

[00:27:48] Well when you go out with a bunch of scientists coring trees they sound like a band because the tree fights back when you core into it. It fights the metal core and you can hear it Eat eat eat. And each Corps has a different tempo and just a different technique and so really the trees all sound differently and you can hear it from a long way off and there's nothing else that sounds like that in the woods you know in the Harvard Forest is a living laboratory so a drone is zipping by or you're hearing the clicking of some kind of strange motor off in the distance. It's an interesting place. It's a natural wood but at any moment you often happen upon something. So you're hearing these sounds of science but you're also of course hearing the wonder of the birds. I love the fall this glorious rustle as you kick through leaves all the way up to here you're sort of boating through weaves these great vast waves of leaves and to watch them and to hear them they're drifting into your house. People are bringing your mushrooms I felt like I was kind of turning into a tree. Does living it so dimensionally and the smells were a huge part of everyday you know they heat with wood at the Harvard Forest. These are wood boilers to hot water to radiators which was so cozy. You know they banged and slammed and they were really hot and it was great.

[00:29:08] But so you're always smelling that wood smoke smell and oaks themselves have a very distinct scent. It's it's tangy. It's got that Tang it's very unlike any other scent. And then the smell of the oil that would woodsy hummus deliciousness it just. And in every weather was different the smells were quite very depending on whether it just rained. I mean I was so entranced really with this surround sound sensory treat every single day.

[00:29:42] And I want to show you some pictures because you know tick tock. Just a sec I think there's the clicker.

[00:29:49] Yes okay. I just want to show you a little bit of my life out there. This is Harvard in the woods. We used to like to say there's just enough Harvard in the Harvard Forest. They love it because they're an hour and a half away from Cambridge and like nobody ever goes there or even knows there's a Harvard Forest. This is the one administrative building I actually had an office with a door. First time in my life

[00:30:13] It's classic New England sugar maples lining the lane. Like I said classic New England. This is where I lived. Believe it or not I rented a little apartment in this house and the cows were my company. That was my son porch I'd go out and have my coffee.

[00:30:31] Here it is in winter winter. That's sun porch was unheated. That's me taking a picture out to the pasture that cows where my good good friend Doug went with me for the first fellowship while we were in Cambridge. But when I was gonna live in Peter's him for there was like I think I'll visit. So it was me and the cows. I told you they heated with wood I wasn't kidding people who heat with would have a special place in my pantheon you know it takes skill and and repeated careful work to bring in good dry hot burning firewood.

[00:31:10] This is Andrew Richardson a professor at the Harvard Forest who made it all possible. He let me come and sit with his lab and come out on the field work at the Harvard Forest which is how I



met John he had this wild idea you want to know what the tree canopy is doing let's put cameras on it. Those are bank security cameras. Believe it or not looking not for robbers in the woods but for leaves. He actually created something that's never existed before a digital observatory.

[00:31:38] These cameras are part of a so-called Fino Cam network that's 250 of them all over the all over North America beaming pictures of the tree canopy and what what it's up to. All through the year you can look at my tree go to the Harvard Forest Web site and type in Witness Tree web cam. There it is. I look at it all day long. There we are going out on our fieldwork. That's me dressed for ticks and John O'Keefe my dear friend and collaborator here's John. Those are his data sheets and you know there he goes twice a week in spring and fall to ground and look at the phonology the seasonal doings of the forest. And you know what I loved about John. He just looked binoculars pencil clipboard.

[00:32:27] Old school and you know he didn't measure much he did measure them the lengths the bugs and so forth. Mostly mostly he paid exquisite attention to everything about the forest what was going on. Summertime I love this high tide of ferns coring the tree.

[00:32:46] That's David. Or a wig from the Harvard Forest. You know everybody helped out. It's really a community there and you know I show up a journalist in residence. I'm surprised they didn't put a bell around my neck. I mean this had to be a little weird for them right. They're all these super pointy headed scientists and I show up to go live with them be with them. And they were so helpful. Dave I need to know how old my tree is. OK. Let's go for it. And that's what he's doing right there is calling my tree we looked at it extensively in spring. And in summer

[00:33:22] And in fall and in winter I was out there every day every season. Bedroom slippers snow shoes muck boots barefoot the wonder of the woods observed in close up detail was my absolute delight during that year. I took all these pictures. God Steve I missed you so much. Steve Rincon my friend at the Seattle Times we usually work together on all these nature stories you know but to have the privilege to observe nature up close in all of its moods and moments these little red EPS for baby salamanders to take the time to really observe a raindrop actually slide down the bark of the tree and form a lens. To you know watch a fern unfurl stage by stage and spring to gather flowers and create a collection of little bits and memories from the woods from my flower press learning how to climb I look a little dubious there don't you think that's Melissa testing my harness. Here we go. This is my very first climb. I'm taking notes ever the reporter. You know in this moment here I think this is probably one of the best days in my life. I really do and I'm actually writing the passage that I'm going to read to you right now.

[00:34:54] Suddenly we were at the top with only the trees ceiling of green resplendent above us and there was the hammock to bear had already set it up including a blanket folded for a pillow. I swung myself around and settling in could hardly believe my good fortune.

[00:35:14] I had packed a picnic. By the way to take up their roast chicken and dark chocolate we ripped into the food then quieted just enjoying where we were. How captivating to see a tree from

within. The light was ever changing the sun a luminous pageant of green and gold as the big oak branches parted in the wind letting the sun spill in then swung back offering light shade not the deep shade of the forest floor But Lacey ever changing with each toss of the wind. Everywhere there was movement a black and yellow swallow tail butterfly cruised through the treetop just past my shoulder. The chickadees called sweetly alert to our presence. The Leaf stirred in every direction as the wind blew and the tree moved with it up down and sideways all at once. The hammock rode the tree in the wind. It's a rocking embrace amniotic and primal. I felt both at home and distinctly a visitor. I thought what familiar and alien things trees are all at once. They remain wild essentially other a kingdom apart. We need them. But they do not need us yet. Watching the oak from up here for the first time I felt I understood clues for our own persistence. I notice the Oaks genius in abiding with other species above and below ground in a diverse interconnected nation of lives from the deer and the bear and the squirrel in the blue jay to the vast spreading nourishing and rival networks amid its roots. It seemed I thought rocking in the Oaks embrace that our task now is to live on this earth. At least as successfully as this tree. It felt like a lesson a personal reckoning an ethical awakening from a human centered or anthro centric view to simply grasp the reality of where we truly stand on this earth.

[00:37:28] We're not separate from nature. We are of it and in it and we need an ethical framework to match. We need a tree culture a nourishing mutualism that embeds us in creation working with one another in collaboration with nature to sustain us in our common home. I want to read. Just a little bit about touring around with John. O'Keefe. The records show us how climate change is altering the seasonal timing of the forest leaf out is coming earlier. With an advance of spring by nearly five days on average since O'Keefe started making observer observations more than 25 years ago. On average. Spring is coming earlier fall is coming later and winter is being squeezed on both ends. Everything in the woods reflected these changes from the level of water in the vernal pools and springs to when the black flies were biting the ground frozen or leaves budding out or finally coming off the trees. It wasn't a matter of conjecture or political argument. The discussions of who does and doesn't believe in climate change in editorial pages. News reports and congressional debates frames this all wrong. Climate change. The trees streams and puddles and birds bugs and frogs attest it's not a matter of opinion or belief. It is an observable fact leaves don't lie. Frost is not running for office. Frogs don't fundraise pollinators don't put out press releases. What O'Keefe had compiled while taking all those walks was the testimony of an unimpeachable witness. The natural world including my big oak. The Witness Tree O'Keefe survey walks were a way to observe the planetary dynamic of climate change on an intimate scale and see its effects tree by tree.

[00:39:54] I just have one last question and then I want to open it up which is when you think of how much impact Mann has made on the landscape on the natural world.

[00:40:05] Do you live your life differently having spent such and having such an intimate relationship with this tree I do and I think it's because I have just become so much more appreciative of the intelligence that surrounds us. It is so easy to forget in our disease into lives living in buildings eating diets that very often are not cued to either place or time living with these lights that defeat the natural cycles of light and dark. It is easy to forget our roots our earthly home our natural being our embedded ness in nature but living with this tree it reminded me of the genius of nature of the wonder

of the living things with whom we are so fortunate to share this planet to which we are so beautifully suited. We belong here and we belong here together. And so I think the gift of this project was appreciation love for this beautiful place. We're so lucky to call home. And a great desire to share that joy. In fact people with love for this natural home that we will take better care of it and I hope persist with the beauty of trees for a long time to come.

[00:41:29] Work will make you a tree geek definitely questions for.

[00:41:35] For Lynda I grew up in a small town in the Midwest and every street at a right angle to our main street was named after a tree. Every single one lived on Chestnut Street. It was popular and pine and oak and you wouldn't believe but the first house we lived in at a big beautiful apple tree in the backyard. I can still see me and my sisters climbing it. That tree was cut down when our new house was built on their property. The second house had a big beautiful magnolia tree and one of my greatest memories and my whacked out sister who bought the house cut down the magnolia tree because it was too close to the front of the house. Something no one should ever cut down a tree that is now used for firewood.

[00:42:27] No one no one ever Well there you have it.

[00:42:34] One question sleeves and I think well we'll ask guys I'll see you and Lynda if you would repeat the question that be great.

[00:42:44] I'll do it.

[00:42:46] Liza was talking about how cool these Fino cams are and indeed they are. This really wasn't an absolutely new invention this idea of being able to see the seasons because of these cameras. And by the way an algorithm a computer formula that basically translates the amount of canopy greenness or color of autumn leaves to these pixels so that you know you got 180 green pixels. It's spring suddenly you've got this many orange and so it was really smart because you no longer could only do your work up close tree to tree on foot like John.

[00:43:24] You need that because you have to know what the understory is doing. And you need that up close. Ground Truth literally. But this was the breakthrough you could suddenly see the forest and the trees. You could be at scale. And that's what enabled these researchers at Harvard and others to make all kinds of breakthroughs in their discoveries about how the forest physiology is changing because of climate change. And if you want to look at these web cams you go to the Harvard Forest Web site type in web cams and you'll see them. It's fun. You can look at the pictures. You know you can check them every half hour. I do.

[00:44:03] I looked at by tree today. Oh it's getting leaves I mean it's funny it's like Facebook for nature. It changes your relationship. You know you suddenly you feel a little bit like a voyeur or it's like Is this really OK.

[00:44:13] I don't even have to get bit by a mosquito so I can see what's going on. And yet of course you don't get the whole story. And so like all of these technological breakthroughs that give you a little and they take away a little it's a little about there's a tension there but it's it's definitely leading to some exciting discoveries.

[00:44:32] Where would you suggest if we when we get attached to this tree in the book in Seattle if we wanted to feel attachment to up another majestic tree you know you need to go meet the queen.

[00:44:44] She is a red oak and this tree is really quite magnificent it's over and volunteer park not far from the greenhouse and you know where the play area is here is the greenhouse. Here's the play area. You come in on the 15th Street side. The queen is resplendent and you're allowed to climb it. There is an organization called Tree Canopy climbers. I climbed this tree with them in Seattle Parks amazingly allows you to just like go climb the tree and it's not even expensive. Children can do it and should it is great fun. You can get way up in this glorious tree and it's it's it's really a wondrous tree. I was just there a Sunday petting it. No leaves yet. You know it's it's you're seeing this climate change thing. Don't confuse your weather with climate. This is different. We're having a cool spring in Seattle a very late spring actually we're about a month behind. But on average there's no doubt that we are now in our third year in a row warmest temperatures ever on the planet. No one should be surprised by that. The warming properties of carbon dioxide mean the more there is the warmer it will get yes I see you in the plaid shirt. Right. So the question is about invasive species. This is an effect of climate change too by the way. I mean even in the Harvard Forest my trees are doing great. It's growing faster than ever.

[00:46:08] Hemlock are being killed by hemlock woolly Daljit which is a small sucking insect not unlike an aphid and because the winters are now not as cold as they used to be. These bugs are on the march. They've been taking over state after state after state and the eastern hemlock have no resistance. And so you know when it gets warmer it also helps breed disease. And out here in the West what we've been seeing is the change in the hydrologic cycle. We're getting a lot more rain rather than snow. We're losing the water.

[00:46:40] Earlier more drought more fire more bugs but invasive species are very much helped by climate change. There you have rain shifts with these insects going into territory where the native vegetation just can't compete with them. Interestingly western hemlock that we have out here. Do not have a problem with this insect and when you go over to the arboretum you'll see a little bags tied on some of the hemlock it's part of an experiment that's going on to try to understand if the western hemlock here have got something special that's enabling them to fight these insects that maybe they can use in the Harvard Forest. I wrote a story about all this which will be in Pacific this Sunday. It'll be the cover story you'll see that tree on the cover and there'll be a lot more there about invasive species climate change and what I learned about the tree right.

[00:47:34] So the question is what about these canopy observation stations so there are two things in that question Nalini not. Carney was the genius researcher who was the first one to actually go up in the tree canopy and figure out there was a whole other suite of life living up there. She made

absolutely Brown breaking discoveries in the tree canopy. She's since gone to another university and is now doing most of her canopy work in Central America Costa Rica especially. There was also in Washington state the wind river canopy crane down in southwestern Washington. Sadly not any longer funded by the U.S. Forest Service. But it was a spectacular tool that enabled researchers reporters I went up in it to go up in a basket and be in the tree canopy and collect samples for research or look around. It was spectacular. Evergreen. I don't know if there is a new Nalini. If it were I mean there's kind of research in the canopy is being done on the Olympics all the time. I did a story a couple of years ago about what was growing in the canopy and the relationship between the trees and the river. And they used climbers to just dart up there and bring down epic fights by the basket load but you can't believe how much is growing and living up there and some of the really exciting discoveries were that there's so much soil created by the mosses and epic sites living up there that the trees will actually sprout Advent vicious branches. This would be like Flora growing a thumb out of her shoulder so we know so we know a lot about trees but we're learning more all the time yes sir. Right. So how natural is this woodland the Harvard Forest is a natural wood but it's been very altered by human presence. These soils were plowed and they were denuded of trees and so they've come back to a suite of native trees and wildlife but the soils will never recover.

[00:49:43] They will always be different from having been manipulated by farming. But it's a forest and even though it's changing because of climate change we mentioned the woolly adulthood it's still a forest. It's just gonna be a different forest. They're going to lose hemlock black birches moving in. Think how much they've already changed chestnut already gone. The Elm trees are already gone. They're working ferociously hard to try to avoid invasion of the Emerald Ash Borer. We have we faced that threat here too. And so we keep seeing changes in the species that are in these forests including the Harvard Forest. But it's still a forest. Well the redwoods. They're doing great. There's not enough of them. Thank heavens we saved what we saved. There is a lot of concern about the Redwoods though because as our climate changes there's a lot of concern that those cool frogs that really are a huge source of their water supply are going to change.

[00:50:51] And if that happens that's a problem. How in the world would you replace it. I mean that

[00:50:58] That beautiful interstitial relationship of a tree in a place with a climate regime is just like the salmon. Each one of those runs of fish is in its place at its time for a reason. And if those fundamental climatic conditions start to change things start to unravel that subtle powerful timing of nature is being disrupted. And I have to say I find that deeply disturbing because the genius of nature is not to be taken lightly. We are not just changing the temperature. We are creating a whole new climate system with feedbacks and interactions of their own that we do not control.

[00:51:48] That was a blight.

[00:51:50] We're talking about the elm tree and the tragic loss of the elm tree in America. This is really is something that's poignantly felt across the nation because there is a beauty to an elm tree. They have this face like shape and they really were thus street tree of so many Main Street American towns for exactly that reason and it this is really as a story of invasive species. Because what what

was going on there was a blight that the native Elm had no resistance to. It wasn't temperature so much. It was the spread of a blight. Very often the scientists at the Harvard Forest like to talk not only about global climate change but global change and the interconnectedness of our world that is so exciting and so renewing. It also comes with a price. You know we're moving species around and shipping things that contain insects and pathogens and pests and you know there's there's a lot of work to be done in creating a more secure situation in Port. You know these wooden pallets that are used to ship things here can carry pathogens and pests and they hitchhike here and who knows what happens next. So the elm tree that's not a climate change thing but it sure is a story about an invasive pathogen. And but the Climate Change link is that as trees are weakened by heat stress drought stress they're more susceptible to diseases and insects and they can help these pathogens and insects spread right.

[00:53:24] So the question is Tell me a little bit about the canopy in the two places. This is funny because when I first went east to write a book about a tree everybody in the NEWSROOM laughed at me. It's like huh really. You don't think we have trees here. And it's so true because I came home for a visit and went for a walk along the scope of the Skolkovo ish River and the Olympic National Park. And you know let's face it right. We've got trees and trees. And I was so reminded of that scale back east is so sort of lovely tiny you know there's so much everything's smaller right. And at the Harvard for us those trees are not old. We're talking 80 120 years old this is a forest that's still regenerating still recovering from the agricultural era. And it's a it's a primarily deciduous canopy and that's different for us too.

[00:54:16] I have to tell you because I am from there it was such a deep evocative reconnection with those smells with those species with the way the light comes through that canopy there's a kind of reset that happens when you go back to wherever you're from. And for me to see that particular canopy again to hear those insects I miss crickets. It was delicious but it is a very different canopy because of this is primarily deciduous form the pines or white pine and in the hemlock. And so it's very different they don't have the big dark brooding forests that we do in the sense of size. They can do dark and deep Hemlock is a dark deep forest very much so. And that's one of the special looks that those forests will lose.

[00:55:08] But for saw size nothing's touch on us also the epic fights you know those rain forest canopies that we enjoyed so much on the west side. That's unique to here.

[00:55:20] That's really something to relish to Warren who's got that killer to more.

[00:55:27] Yes this question is a great question about the international interest in the forest and this is really true. This was a spectacularly attractive place to people from all over the globe and they were looking at absolutely everything from landscape history to atmospheric exchange of the canopy to micro razzle fungi in the communities and the roots.

[00:55:54] And this is the kind of place where you could walk down a forest path and you see this PPC pipe sticking out of the ground with a top on it and you think I wonder what that is. Well the next

time you walk down that same path the top is off and there's some guy on his hands and knees sticking a camera down there to look at the roots grow. Wow. That's how it was. And so the interest is international there was a core of 40 scientists who were there all the time scientists and other stuff. And then this visiting tribe of people like me artists writers and primarily scientists coming from all over the world to look into absolutely everything if you can wonder it you can study it and they do one more I love that question. So I think the surprises for me never stopped coming. They came every single day and they were sometimes very mundane. I never knew a slug would look like that coming over the route when I'm lying on the ground being eyed. I. That was a shocker. I never knew that their little eyes were so perceptive because the slugs saw me and I saw this leg and was like sorry and pulled his little stalks. Who knew.

[00:57:12] So it could be as mundane as that to these really transcendent surprises of what does it feel like to be in a tree not under it in it to feel it move. I never knew what a tree felt like to stand in it as it's in the wind. It's a lot like being in a boat and when you come down you have that same seasick not seasick but you know that motion of the sea because you've been moving in the tree they don't just go side to side they go up and down. I never knew that. I didn't know that you could see something as global and seemingly too often thought about abstractly as climate change physically directly personally that changed me thank you very much. Applause

[00:58:09] Thank you so much. I'll be over here signing. Thank you for coming. This podcast was presented by the Seattle Public Library and Foundation and made possible by your contributions to the Seattle Public Library Foundation. Thanks for listening.