





Cool Tools Transcript







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Theme: *Understanding forest systems begins with measuring the forest for a wide range of information, such as volume, density, composition, etc. Foresters have invented many job-specific tools to make the inventory tasks accurate and efficient. A lot of math is built into field tools. This episode also includes another way to use forestry tools; using them to create music!*



Main Points

- Why measure a forest? What to measure?
- Lots of math hidden in the tools.
- Tree diameter. Tree height. Stand density.
- Includes the “Timber” music video!

VIDEO	AUDIO
	<p>Now, foresters know a lot about forests, like these behind me, here. But, HOW do we know about forests? What sort of data do we collect? And what sort of tools do we use to collect those data? Well, in this episode of BeLEAF It or Not! we'll show how to use some really cool tools that foresters use everyday</p>
<p>OPEN (canned) BeLeaf It or Not! panel</p>	
	<p>G: Here we are in the forest. B: Look! A tree! G: Hey Bill, tell us what you're doing there. B: Well, I'm measuring the tree's diameter, Georgia. G: And well, why would you do that? B: Well, foresters need to measure a lot of things in the forest in order to manage forests properly. It's sorta like having a store. You gotta know how much stuff ya got on the shelves, and how fast people buy it, and when to buy more stuff to restock those shelves. G: So, it's an inventory. B: Yeah, it's an inventory. G: OK. What do you think? Other than diameter, what would you want to know about a forest, then? Maybe tree height? Density of the trees? How closely they grow together? How much light gets to the ground? B: Yeah, all of those things. And a bunch of other things, too. And, foresters have a lot of really cool tools to help us take those measurements. So, let's take a look at some of those measurements and some of those tools.</p>
	<p>G: Well, let's start with an individual tree. How wide is a tree? How tall is it? B: And, why would we want to know that? G: Well, if you know diameter and you know the height, you can calculate volume, which is a way to determine how much wood we have in the tree. B: And that takes a lot of math! Did you know Georgia that . . .</p>

	<p>G: Well, maybe we shouldn't start with the math just yet. Let's take a look at how we would measure these things first.</p> <p>B: OK. That sounds good. Let's do that.</p>
	<p>G: There are many ways to measure the diameter of the tree, or how wide it is.</p> <p>B: I know a good way! We can cut down a tree and we could measure across the stump!</p> <p>G: Oh, Bill . . .</p> <p>G: You know, instead of cutting the tree down, we can use a tape measure to measure around the tree but, of course, that's circumference and diameter.</p> <p>B: So Georgia, what's the difference between circumference and diameter?</p> <p>G: Aaaah!</p>
	<p>So, what is the difference between circumference and diameter? Circumference is a measurement AROUND the tree. Diameter is a measurement from one side of the tree, on a centerline, all the way to the other side of the tree. Now, we could use a formula to figure out diameter from circumference, but if you did that for all the trees in the forest, well, that's a lot of work.</p>
	<p>G: All of these mathematical calculations do take a lot of time, though. So, foresters use a different kind of tape measure that has a different scale. This automatically measures the diameter of the tree without the calculations.</p> <p>B: That's right Georgia. And when you look on this side, it's your regular inches and feet scale that you see on any tape measure.</p> <p>G: But on the other side, it's a different scale that automatically measures the diameter.</p> <p>B: Well, show me how that works, Georgia.</p> <p>G: OK!</p>
	<p>G: So, let's take a look at this black cherry tree, and measure its diameter. You have to measure it 4.5 feet above the ground. Wrap that diameter tape around the tree. Make sure you have the right scale showing. Wrap it around and line it up with that zero mark. Hey, look it there. We have a 13.5 inch tree in diameter.</p>
	<p>G: We've covered diameter pretty well, but what about height? We're not gonna be talking about chainsaws and cutting down trees again are we?</p> <p>B: Well, that would be fun Georgia but, nope, we'll let this tree here live. But, I do want to know how many feet it is, up to that first branch. And foresters have lots of cool tools to choose from in order to do that.</p> <p>B: Now, if we wanna use this Merritt hypsometer to measure the height of a tree to that first branch, I stand 66-feet away from the tree, hold the stick out, the hypsometer out, at 25-inches. Put the base of the hypsometer on the stump height, and then I look up to that first branch, and then there's a scale on the side of the stick that tells me I've got about five eight-foot logs.</p>
	<p>G: Another important measurement we need to take for a tree is its age.</p> <p>B: That's right. When we've got a forest where some of the trees begin to grow old, we'll harvest some of those trees and that leaves space for the younger trees to grow a little bit better.</p> <p>G: Yeah, and now we all know that we can count the tree's rings</p> <p>B: Do we get to cut down another tree now!</p>

	<p>G: No!</p> <p>B: No.</p> <p>G: Because we have a special tool called the “increment borer” that will allow us to estimate the tree’s age without having to cut it down.</p> <p>B: That’s right.</p> <p>G: Bill, do you wanna demonstrate how those increment borers work?</p> <p>B: Yeah, we can do that. Let’s go take a walk.</p> <p>G: OK.</p>
	<p>B: Watch this. We put the borer in. It’s a hollow tube with some threads on it and I’m aiming for the center of the tree. And we’re gonna go in . . . we don’t have to go through you know, because we only have to the middle because the rings are round. And so, when we get to the center, or close to the center, then we know we have all the rings that we need in order to count them. And of course, we all know that counting the rings on trees will tell us how old a tree is.</p> <p>B That look far enough? Think I’ve gone in there? OK. Well, get out my extractor, it’s shallow, and put it in. Ha! There’s the wood. I can feel it. Slide it past. Then, we’ll break off. Hear that? Break off that core, and then we can pull out the core. We call an increment core. And you can see the rings in here, of the tree. I’ll turn it so you can see a little bit easier. And you can count the rings . . . one, two, three, four, five, six, . . . and on you go. And we can tell how old the tree is, and how it’s been growing by how close together or far apart the rings are, without having to cut the tree down.</p>
	<p>B: Trees grow best with a certain amount of light. Foresters use a term called “basal area” to measure that amount of light, which we’ll explain in just a minute.</p> <p>G: If we imagine cutting-down all the trees on an acre, at a height of 4.5 feet, and then we measure the area of all those stump-tops, we would have the number of square feet. That number of square feet is called “basal area”.</p>
	<p>B: Now, foresters need tools to help us measure basal area. Got a couple of tools to show you here today. We’re not gonna explain why they work, because there’s a lot math behind it. But, we will show you how to use these tools.</p> <p>G: One of the simplest, and cheapest, ways that we measure basal area is with this tool we call an “angle gauge”.</p> <p>B: The gauge itself must be held exactly 24 and 3/4 inches from her eye. You start with a tree that you can remember, and then slowly turn a circle and count all the trees that are wider than the slot in the gauge. This tree is “in” . . . and this tree would be “out”, or we don’t count it.</p> <p>G: So, here’s the easy part, once you’ve counted the number of trees that were “in”, you just multiply it by 10. So, let’s just say I counted six trees, total, I multiply that by 10, and I have 60 square feet per acre.</p>
	<p>B: We can use a “prism”. Same purpose as the angle gauge, as I look through the prism, part of the stem is offset, to the left, but it’s still touching the standing part of the tree. So therefore, the tree is an “in” tree, or it’s a tree that we’ll count for basal area.</p> <p>B: And here, the tree that Georgia’s standing next to, you can see the offset part of the tree does not touch the standing part of the tree. So, that is an “out” tree. We would not count that tree for basal area.</p> <p>G: Something’s missing! Eh.</p>

	<p>G: Now, foresters have many other kinds of measurements that they take in the forest and a lot of other different kinds of tools. We always want to use the right tool for the right job.</p> <p>B: Georgia, that's true. But you know, not everybody looks at the same way at these tools than foresters do.</p> <p>G: Yeah, take a look at how these kids are using these tools in a really creative way.</p>
<p>MUSIC VIDEO</p>	
<p>OUTRO</p> 	<p>B&G: Holy cow!</p> <p>B: That was pretty neat.</p> <p>G: That was something.</p> <p>B: Yeah, you know these have been just a few tools that foresters use to help measure trees, and measure the forest, so that we can better manage them.</p> <p>G: And using all these tools, I have to admit, is just plain fun.</p> <p>B: No kidding Georgia. A lot of fun. And with that, we'll see you next time on . . .</p> <p>G: BeLEAF It or Not!</p>
	<p>Great Lakes Digital Video Michigan State University Extension Great Lakes Timber Professionals Association Society of American Foresters, Foresters Fund Michigan Society of American Foresters Upper Peninsula Sustainable Forests & Wildlife Fund Weyerhaeuser Giving Fund Hartwick Pines State Park</p>