



Smithsonian Environmental
Research Center

Smithsonian Institution Global Tree Banding Project System



A User's Guide

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About

The Smithsonian Institution's Tree Banding Project is a citizen science program that contributes to research about tree biomass by tracking how trees respond to climate. Through citizen science programs, students and teachers like you contribute to ongoing scientific work. In this program, students around the globe monitor the rate at which their local trees grow, learn how that rate corresponds to Smithsonian research, and compare their findings with those of other students worldwide. Once involved, you will help to create the first global observatory of how trees respond to climate! As part of this program, you will be contributing vital information to an important ecological study. This project is great for learners of all ages; from elementary students to life-long learners.

[Sign up Today!](#)

You will receive a free Tree Banding Kit that includes everything that you will need to get started. After you get your kit, your class will need to:

- Pick ten trees in your schoolyard for study
- Prepare and install the dendrometer (tree) bands
- Allow four weeks for the bands to settle

After four weeks, when the trees are ready, you will use the digital calipers in your kit to measure the gap in the bands. This measurement will establish a baseline for growth. At the minimum, we would like you to take two measurements in the spring and two in the fall to help us monitor the growing season. You may, however, take as many measurements as you like. The more data we get the better!

The Smithsonian Institution's Tree Banding Project is part of Shout, a collaboration between the Smithsonian Institution, Microsoft Partners in Learning, and TakingITGlobal. ,

The Shout program offers:

- Online webinars hosted by the Smithsonian Institution that feature some of the world's leading scientists





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and environmental experts as well as representatives of other fields who bring diverse perspectives to the issues at hand. You can participate in the live sessions in real time or access the archive. This archive accommodates all time zones and schedules.

- Access to the Microsoft Partners in Learning Network, a global community of educators who value innovative uses of information and communication technology, in order to share environmental education resources, experiences, and best practices with teachers around the world.
- Engagement of students in TakingITGlobal's online community.
- The www.shoutlearning.org website that ties these elements together and provides access to additional tools and resources to support a range of “student quests” – calls for deeper involvement that can range from capturing and sharing scientific data to developing youth-led initiatives for positive change – through which students can earn Smithsonian Badges.



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Registration and Login

To sign up, register for, and receive a Tree Banding Kit, click on the blue **Sign up Today** button located in the middle of the Home page and the About page.

To sign up, please fill out the registration form on the website.

Once you sign-up, a notification will be sent to the Smithsonian for validation purposes, and you will receive an email explaining how to log into the Tree Banding website and receive a free Tree Banding Kit.

Your account is now active, you may login at anytime. To login, click the login link on upper right of the home screen <http://treebanding.si.edu>. This will take you to the login page for the site. On the login page enter the account email address and password that you used for registration. Click submit and you will be logged into the site with access to all the pages including the Manage tab which will allow you to enter data for your trees and tree measurements once you receive your tree-banding kit. If you can't remember your password, click the "I forgot my password" link and a new one will be emailed to you.

Once you have logged in, please click on the "My Account" tab and confirm the accuracy of your profile information. In order for you to start the project, we will need to mail a Tree Banding Kit to you. To what address should it be sent? Please enter your mailing address on the registration form on the website and double check its accuracy to ensure proper delivery of your Tree Banding Kit. Please allow several weeks for processing and delivery of your Tree Banding Kit.



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Home

The Home page has a brief introduction to the Tree Banding Project and is also where you can see a snapshot of who has been measuring trees around the world. This page includes recent tree banding news and updates on participating schools. If you click on a school's name, highlighted in blue, or the picture of the tree in the "*Who has been measuring?*" section, you will be directed to some basic measurements that the school has made.

You can also use the search bar on the right side of the page at any time while navigating through the site to see other project participants. Just enter a school or organization's name, and if they have registered with the program their school or organization's name will be returned in the search results. Click on the school name and their tree data will come up.

Tree Data

The Tree Data page is where users can browse through other school or organization's recent data. If you click on a school's name, highlighted in blue, or the picture of the tree in the "*Who has been measuring?*" section you will be directed to some basic measurements that the school has made.



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Manage

The Manage page is where users add new data or edit existing data. You will need to be logged in to access this page. You will fill out new tree profiles on this page and enter measurements as you track your tree growth throughout the year.

Once you have read through “**How to prepare and install your dendrometer**” (which can be found on the CD included in your kit as well as at the bottom of the [About](#) page on <https://treebanding.si.edu>) and have installed your tree bands, it is now time to start entering your data into the database.

Each tree that you measure will have its own tree profile. You need to create one profile per tree; however, you can edit the information at any time.

To get started, click on the blue [create a tree profile](#) link. You will then need to fill out the information below in order to add a measurement:

Click on any blue “?” icon for more information.

- **Tree tag number:** This is the number on the aluminum tag that you will nail to each tree that you band. Every tree that is part of the SHOUT project will have its own unique number. This will be how we identify your tree throughout the project. **Click on the blue “?” icon for more information.**
- **Tree Species:** Try to identify the tree species. When you enter this onto the data sheet, please use the scientific or Latin name, as common names vary from region to region. **Click on the blue “?” icon for more information.** If you have trouble identifying your tree, feel free to ask us for help. You can email pictures of the bark, leaves, crown and any other information you can gather to treebanding@si.edu.
- **Tree Type:** Is your tree needle leaf or broad leaf? **Click on the blue “?” icon for more information.**
- **Crown Class:** This describes how much light the crown or top of tree gets relative to nearby trees. If the tree is solitary or if it’s top gets full light, then we call it *totally lighted*. If its top receives some full light we call it *partially lighted*. If it is in full shade, we call it *totally shaded*. (See Figures 1-3 for diagrams.) Select the description on your data sheet that matches your tree most closely. **Click on the blue “?” icon for more information.**



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Figure 1: totally lighted

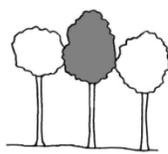


Figure 2: partially lighted

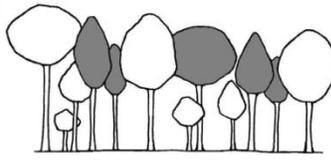


Figure 3: totally shaded

- **Initial Tree DBH:** This is the measure of distance directly across the middle of the tree at 1.3 meters above the ground. You will need to calculate this using your circumference measurement and this formula:
 - $Diameter = circumference / 3.14159$ or π
- **Date of initial measure:** The date that you install the band and take an initial dendrometer measurement. **Click on the blue “?” icon for more information.** Once you have filled out all of the necessary information, click the [create](#) button. This will take you to a page giving you the option to upload a photo of the tree. If you do not have a photo, a generic tree graphic will represent your tree in the system. You may select a photo from your computer to upload. **For privacy reasons, please make sure that your photo is a picture of just your tree and doesn’t include any photos of students.** You may preview the photo by clicking on the [preview my photo](#) button to make sure that it is the photo that you want to include in your profile. Once you have selected a photo, click the blue return button. This will take you back to the “*create a tree profile*” page. Confirm all of your information and hit “save.” If you are not sure about your data, you may delete the profile.
- **Year/month/date/time:** Please record this information every time that you take a measurement. It is **very important that you use the same time of day to you measure your tree, so please try to measure your tree at roughly the same time every time you collect data.** Click on the [blue “?” icon for more information.](#)



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- **Gap width:** This measurement is how we will track tree growth, so it is very important that you carefully take this measurement. To get this measurement you will need to use your digital calipers. **Click on the blue “?” icon for more information.**
 - To get started, put the battery into the caliper.
 - Set the units to millimeters (mm).
 - Make sure that the “jaws” of the caliper are completely closed and that the screen reads 0.00. If it doesn’t, press the zero button.
 - Use the top jaws of the caliper to make your measurement.
 - Place the jaws inside the window and roll the wheel until the jaws rest snugly against both sides of the opening. (See Figure 4, below.) **Record your measurement to two decimal points, for example 1.01 cm.**

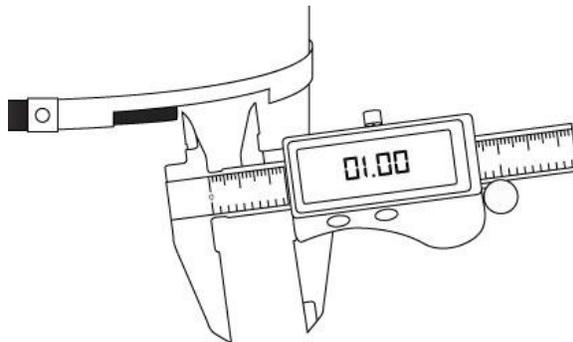


Figure 4

- **Recent temperature:** In this section, record what the temperature has been over the past two weeks. Has it been cooler than normal, hotter than normal, or about normal for that time of year? Trees take a little time to respond to weather, so knowing the relative temperature for a period of two weeks is important. **Click on the blue “?” icon for more information.**
- **Recent weather:** In this section, record what the general weather conditions have been like over the past two weeks. Has it been generally cloudy, generally sunny, or in between? Has it been drier than normal, rainier than normal, or about normal for that



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time of year? Trees take a little time to respond to weather, so the past two weeks' weather is important to know. **Click on the blue “?” icon for more information.**

- **Remarks on tree condition:** Please record any other information that you think might be useful for us to know. Where is the tree on your school yard? Is it near a road or other trees? Was there a huge storm 2 weeks ago? Is your tree healthy or is it starting to die? Note any information that will help us get to know your tree a little better. **Click on the blue “?” icon for more information.**

We will be reviewing and vetting all of your submissions for scientific accuracy. To delete a tree profile you must contact the system administrator.



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Reports

The reports page allows you to create some basic graphics using your school or organization's tree data. You can also look at tree data from other organizations as well. This page gives you several basic options as well as the ability to download any data that you want from our database.

- To create a graph for one tree, select the blue link [Gap width over time - single tree](#). From the dropdown menu, select a tree tag ID number and click "submit." This will generate a simple line graph tracking the growth of the tree you selected. You can right-click on the image if you want to copy the graph.
- To create a graph for all the trees that a school is measuring, select the blue link [Gap width over time - multiple trees](#). From the first dropdown menu, select an organization. Select the starting date and ending date of what you will want to graph. This will generate a simple line graph of the trees that have been measured within a specific time period. You can right-click on the image if you want to copy the graph.

If you would like to create more complex graphics or use the data in a different way you may also download any data set you like by selecting the blue link [CSV Measurements](#).

From the dropdown menu, select the school or organization for which you want to download data. From there you have the following two options:

- You can "preview" the data in tabular format by clicking the [show/hide] link below the **view tabular output** header. This will expand the data, and you will then be able to right-click and copy this information.
- You can create a CSV (Comma Separated Values) file with the data displayed on this page by following these steps:
 - 1. Select the **bold** text.
 - 2. Copy and paste the text into a blank notepad document.
 - 3. Save the notepad document with a .csv extension (for example, myData.csv).
 - 4. After saving the document with a .csv extension, close the document.
 - 5. Open the document in Excel or any other application that can process .csv formatted data.



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My Account

In order to start tree banding, we will need to mail a kit to you. Your Tree Banding Kit will be shipped in a box weighing roughly 2kg and measuring 45x30x8 cm. Please enter your complete mailing address, confirm that you can receive a package this size and make sure to include:

Street

City

State

Country

Zip/Postal code

Coordinates Please record the latitude and longitude of your location. You can either use a hand-held GPS unit or plot your location using an online map. Please record this in decimal degrees if possible. Be as specific as you can, as this will show you and other Tree Banding participants where your trees are located.

Example: 38.90 N, -72.93 W

You can edit your profile at any time by clicking on the blue [edit my account](#) link. When you are done editing or filling in your profile, make sure to click the grey **save** link at the bottom of the page.

Please double check that your school or organization's name is correct as this is how you will be identified by other users on the site.

Anytime that you see a blue "?" you can click on it for more information.