

CITIZEN SCIENTISTS TRAINING

Mt. Tabor Park, Portland, Oregon

October - November 2021



Summary

"NASA's citizen science projects are collaborations between scientists and interested members of the public. Through these collaborations, volunteers (known as citizen scientists) have helped make thousands of important scientific discoveries." (NASA) In January 2021, using the GLOBE Observer app, the Mt. Tabor community joined this global network of scientists, students, teachers, hikers, and nature lovers in collecting Earth Science data and sharing in this international network spanning 120+ countries. Beginning in January 2021, what began as Tree Medicine Hikes led by Dr. Candace Gossen through the Portland Hiking Meetup Group, more than 400 hikers began observing, sharing and learning about the trees of Mt. Tabor Park. Forming small groups, they began measuring the old growth forest known as Mt. Tabor. Collecting tree height, circumference, and age on more than 150 trees between January and April, Dr. Gossen and the Friends of Mt. Tabor wrote a small conservation grant to the Mazamas to continue collecting data during the Fall and winter 2021. The Ronin Institute, supporting Independent Scholars was instrumental with supporting Dr. Gossen's mission to train Citizen Scientists and expand the ecological knowledge of the park. Four dates were organized at the end of October and 48 eager community members showed up, ready with app in hand to learn more about the trees. Another 46 hikers attended the Tree Medicine hikes making it a collective of 94 new Citizen Scientists with a mission to observe, collect and add new information about the trees and forest ecology into the global community. In this Field Report, we summarize the Citizen Science Trainings which will continue on into 2022.

Intro

E. O. Wilson asked “How are we going to manage the planet and keep it sustainable if we know so little about it?” Science has been the bridge of knowledge and until recent years, literature and specimens of life have been confined to a small amount of museums in Western Europe and North America. In order for anyone to learn about what has been observed and collected, one had to travel long distances to visit these museums. Therefore only those with privilege have been able to participate. With the insistence of Dr. Wilson and the arrival of internet technology the Encyclopedia of Life and the Census of Marine Life came to life, accessible for all just less than 20 years ago. The rate of learning about the diversity of life however and its changes is still about 18,000 species a year (Wilson, 2013).

Under a rapidly changing climate, this is the time, where humans acting as a global collective, as Citizen Scientists, are becoming the key in observing and making change. The idea of the Citizen Scientist has broken the barriers to privilege and opened the doors to anyone with curiosity, skill and a phone in their pocket. Their collective information becomes part of a global database and accessible to everyone. The museum collections are now becoming available online, but it is only those “linked solidly to knowledge of real living systems have much chance of being used.” (Wilson, 2013).

The Tabor Tree Project is a Citizen Scientist Project observing change in an old growth forest known as Mt. Tabor in Portland, Oregon. This 200 acre urban park is located on a dormant volcano. For the people of Portland and the Pacific Northwest, this forest is connected to the lifeblood of rainfall, and directly to the watershed of Wy’East otherwise known as Mt. Hood. Global Warming has been changing the climate of the PNW with massive wildfires and droughts, and the toll on the forests are now visible. It is here, at Mt. Tabor, where Citizen Scientists, hike participants, lover of trees have begun to collect information on the forest using the NASA GLOBE Observer app. With the uploaded information, people from around the world can learn about trees in the PNW, NASA can make accurate assessments on carbon sequestration, scientists can use the collected information on new studies, where mountain climbers can be first observers,

and city administrators can make informed decisions all based upon the collected information of the Citizen Scientists of the Tabor Tree Project.

Objective

The Mission of the Tabor Tree Project? Simply, identify as many trees as possible. No one knows for sure how many trees lie within the 200 acre urban park, but Mt. Tabor is special, it is an old growth conifer forest with some near to 500 years old. Before Portland was a city, when the Multnomah were fishing in the Columbia, these trees were there with them. The giant trees, and even the young giants (*Sequoiadendron giganteum*) just 100 years old will one day reach higher than any tree alive and become more than 3000 years older. Can we as Citizen Scientists, become aware of the trees, their lives, their changes, and grow old among them, leaving generations of legacies to follow? First, identify the height, circumference, age and location of as many trees as possible. Along with that information we will include changes in soil moisture, bark, cones, seeds, flowers, birds, bees, dandelions, owls and as much information for each tree possible. And do it over and over again to see how things are changing over time.

In 2020 there were major wildfires that shut down the city of Portland for over a week with 500+ AQI and I watched through my glass doors, looking up at the trees of Mt. Tabor, the birds gasping on their branches, the wilting tops of the trees literally falling over, choking. I wanted to know how these wildfires affected the trees and this ecosystem. For me, and so many, the life of the trees are embedded into our human lives and there is no separation. We look to the trees, as signs, as reflections and the more we learn about them the more we learn about ourselves. This is our mission, can we actually measure the increase in Natural Killer cells when we walk through the conifer forest, or do we just feel better? Some things are impossible to quantify, but feeling better is a quality that can be measured.

Dates & Participants:

In order to uniformly and properly measure the trees, we are using the GLOBE Observer app, a Worldwide Science and Education Program created by NASA. This app is available to anyone with a smartphone. Once downloaded, the app can be used on or

offline in the field. Relatively simple, loaded with informative tutorials, the phone now becomes a tool to collect and upload data to the NASA global database. In Part One of the Tabor Tree Project which began in January 2021, we hiked in groups through the forests, and collected information on 175 trees using the phone of Dr. Gossen. Some measured the circumference and distance with tape measures, others took photos, and the data was collected and uploaded. Dr. Gossen worked with NASA to create a team project, with a discrete identifying number entered into the program each individual users collects and uploads their data directly into the project. Part One ended in April 2021, and Part Two picked up in October, one year after it began.

Part Two of the Tabor Tree Project began in October 2021 with 4 new Citizen Scientist training sessions on Oct 28, 430-6 (12 participants), Oct 30, 2-30pm (19 participants), Nov 1, 430-6pm (10 participants), Nov 3, 430-6 (3 participants). There were 48 attendees. People love trees! All of the sessions were held outside of the Visitor Center at Mt. Tabor Park, and typical Portland it was rainy and cold most of the time. The participants included a broad range of ages, occupations and interests and are now everyone is equipped to continue adding into the data collective. Adding to the special training sessions Dr. Gossen also continued offering a daily Tree Medicine hike via the Portland Hiking Meetup Group and another 46 joined the Citizen Scientist group. Oct 29, 30, 31, Nov 1, 2, 3.

Via the GLOBE Program, The Tabor Tree Project data is uploaded by each member is being observed and collected by Dr. Gossen for continuing study. Each participant is also learning how to take field notes and transfer the information onto a computer database at the Visitor Center of the Friends of Mt. Tabor. *(The computer was awarded as part of the Mazamas Conservation Grant in 2021).*

Main Lessons Learned

The training sessions were 90 minutes long, and with the winter conditions of rain, cold and wind, the attention spans were short. Some people had not downloaded the app prior to the session and could not utilize the steps in the data collection while they were there and depending on verbal cues to repeat later. It was important to follow

up quickly with a pdf version of the tutorials of the slide shows directly to their emails via Mailchimp so that they could return to the instructions as needed. Even with the GLOBE tutorials, it was not clear as to certain important factors such as how to hold the phone, and how to use it when taking measurements. The in person training sessions are invaluable for these details. Having an indoor space, non covid will be something we look forward to during the next trainings. The participants themselves began to organize into small groups to go out together and collect data, main lesson learned, people like communities, perhaps we are more tree like than we know! *(The training sessions were supported by a Travel Scholarship fo Dr. Gossen through the Ronin Institute.)*

Forest at Mt. Tabor and relation to PNW forests

Mount Tabor on the National Register of Historical Places, is an extinct volcano within the city limits of Portland, Oregon. It was given its name by Plympton Kelly during the pioneer days of the mid 1850s, as to the settlers that arrived it was a place of salvation. At the same time it was the heartache of Broken Treaties, more than 60 tribal nations ravaged by disease, and finally rounded up and moved to reservations:

In 1850, the first superintendent of Indian Affairs for the Oregon Territory, Anson Dart, set out to negotiate with the Indians. The mandate from the federal government was to get tribes to forfeit all their land claims west of the Cascades and move to reservations further east. The tribes would be compensated in various ways.

By the time Dart returned to Washington D.C., he had 19 signed treaties. In these documents, the tribes ceded about six million acres of their land to the government.

However, he failed to move the Indians out of western Oregon. Congress never ratified those treaties, and the president never signed them into law.

"What happened to the tribes quite often is that they thought they had a binding agreement. ... They perhaps moved to the restricted area they had agreed too. And then money never came from the Congress because the treaty was not ratified."

Robert J. Miller

Law Professor (Lewis & Clark College), Tribal Judge and Author

Geologically, there are thirty-two cinder cones within a thirteen mile radius and on Mt. Tabor there are two types of rock comprising this volcanic landscape: volcanic from the millions of years of activity on the Ring of Fire, and the river cobbles left behind from the glacial times of the Missoula floods that formed the Columbia River Gorge. With a peak elevation of 636 ft (194m), it is a sea-level forested park. The original old growth of giant trees are now just a story and a name given to Portland called “Stumptown.” As a result of the cutting of nearly every tree clearing a way for the city and farmland in the SE where Mt. Tabor lies, the new trees now have become the second old growth of a conifer forest mixed with exotic and native trees under its canopy.

This landscape however was saved by the reservoirs placed here beginning in 1894. Using the elevation of the peak, water was piped directly from the watershed Bull run on Wy’east (Mt. Hood) 25 miles SE of Mt. Tabor. For the city of Portland to thrive, more than a hundred years ago, seven reservoirs were constructed, 5 of which were at Mt. Tabor. Today, only two of the reservoirs will remain open, the others fate are being demolished and set into underground containers 100feet below the surface. The water however is still from Bull Run, it is just not visible any longer.

The connection between Wy’east and Mt. Tabor are significant when one looks at the connections between water and forests of the PNW. Even the range of volcanoes itself between British Columbia and California had a native name. The Cascades were known as **Yamakiasham Yaina**, or "Mountains of the Northern People” Twenty-five miles rain and snow fall onto the mountain slopes and makes it way through the watershed, forests and pipes that arrive at Mt. Tabor. It is the same rainfall in whatever form it takes, that feed the trees. There is a distinct connection between the small 200 acre urban old growth park, and the conifer forests of the entire PNW ecosystem, and it is here we can study change over time.

Reason for Conservation

The massive, evergreen coniferous forests in the Pacific Northwest are unique among temperate forest regions of the world. The region's forests escaped decimation during Pleistocene glaciation; they are now dominated by a few broadly distributed and

well-adapted conifers that grow to large size and great age. Mt. Tabor is an isolated part of this forest system.

Cooperation & Results

Through the cooperation of hundreds of hikers and stewards of Mt. Tabor we were able to capture an audience and turn it into a science project. Through a tool created by NASA, made so easy as to using one app on a phone people already carry in their pockets, they are the connections between nature and humans on a global scale. Through this cooperation beginning a year ago there are now at least 394 participants that are observing, data collecting and taking care of this urban old growth forest and remaining as stewards for the future of conservation of this beautiful place.

Future: Research Questions

In 2022, we will continue training new participants, continue leading Tree Medicine Hikes, and expanding into creating a youth crew and turning the small volunteer only Visitor Center at Mt. Tabor into a science lab and ecology center.

On the expanded horizon once people become proficient with collecting information on trees, they will expand into using the other sections including clouds, mosquitoes and landscape which is currently established with the GLOBE Observer app. Adding to our local information we are wildlife watchers and are proving to notice there is significance with owls, predator birds and songbirds with the health of trees. Plant allies are also noted, root and mycorrhiza health are also significant when studying how trees talk to each other. Noting there is a unique bond between the Douglas Fir trees and the Big Leaf Maples has proven that osculation is a real thing, the joining of two species of trees as a choice, a relationship out of survival or want, we will continue to watch. There is much to expand into, and to each Citizen Scientist with unique eyes there is much that will come from spending time in the trees that we cannot imagine just yet. But we are watching.

Summary and Conclusions

The Second part of the Tabor Tree Project which began in October 2021 with 4 new training sessions at Mt. Tabor, was a great success. With a 94% show rate of 48

signees, it was proven that the people of Portland Love Trees! And the Friends of Mt. Tabor is a vital center for learning and sharing this love and community. Ninety-four new Citizen Scientists were added to the community and we will continue to support via information letters periodically until the new trainings roll around again in April 2022.

Acknowledgements

We are very grateful to Hap Pritchard, Director of Friends of Mt. Tabor and all around steward and teacher of nature, and Dr. Candace Gossen, Naturalist Scientific, who created this idea out of a covid shutdown and found that the forests heal even when you feel like there is nothing left, the trees stand waiting for each of us to interact and see. We are also very grateful to the Mazamas Conservation Program for the grant received to support the data collection of our project, and to the Ronin Institute for supporting Dr. Gossen's return to offer the trainings and developing the third stage of the Tabor Tree Project.

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Tabor Tree Project - Guidelines Newsletter 2B- improved images and additions

The campaign URL for this campaign is: <https://mailchi.mp/b573f61471b4/tabor-tree-project-guidelines-and-globe-observer-app-info-newsletter-9772217>

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