Growth

Anna Guerrero

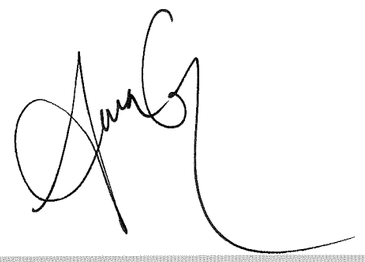
The human lifespan—which is relatively short compared to that of a single tree, and strikingly short in relation to an entire forest or landscape—makes it difficult for us to conceptualize the timescale on which trees and forest ecosystems are living and changing.

Throu se paintings, I sought to translate the temporal element of trees and forests into a m accessible by everyone. In order to do so thoroughly, I conducted a two-month s y o answer the question, how do we develop through time, and how does that development affect our experience? The "we" and "our" includes humans, trees, forests, and landscapes. The study was comprised of the examination of tree rings, ancient sediment cores, and forest landowner decision-making; the integration of plant physiology, wood anatomy, scientific literature, creative literature, historical artifacts, and artistic works; and fieldwork and sketching in old-growth forests, farms, long-term ecological research plots, historical archives, and museums.

While these scholarly pursuits deepened my understanding of forests, each one of us has, just by the virtue of living and growing, the ability to appreciate and empathize with trees. These paintings connect the experiences of people and forests in parallel developmental periods to elicit a more intimate and accurate understanding of how forests grow and change through time. It is also my hope that these paintings empower you to use the experience of trees and forests to enhance your own relationships with the past, the present, and the future.

The ages in the paintings are represented in chronological order, and were chosen based on two criteria. The first was that an age must demonstrate a significant shift in development and experience for both trees and people. The sec the age must adequately represent an emotional human experience and a physi experience. For example, Beware the Tempest depicts a young adult in the mi a raging hurricane. As a young adult, I may personally attest to the emotional turmoil and uncertainty that accompanied my new independent life. While a forest may not be worried about choosing a career or being in love or saving the world, a hurricane can come along and dramatically alter its course.

I worked to portray each tree species accurately and to create forest communities (such as the birch, beech, and maple in Beware the Tempest) based on assemblages often found in New England forests. The captions illuminate the scientific phenomena at work within each piece; the final task—using personal experience to understand your own connection with the phenomena—is up to you.



Anna Guerrero

We Grow, Together 2016

Acrylic and Colored Pencil on Paper

Even when a tree falls, it is a contributing member of its ecosystem. It provides a home for all sorts of wildlife, create nutrients for the soil, and even become the base for new life. When seedlings sprout up on a fallen tree, the fallen tree is called a "nurse log," providing nutrients and a physical foundation for the next generation. Hemlocks are known to act as nurse logs for many tree species, including the black birch shown here. Right now, an insect called the hemlock woolly adelgid is killing eastern hemlock trees at an alarming rate. While it can be morally deflating to see a single species suffer, the forest is resilient and will recover. Whether it is by allowing light to hit the forest floor, or acting as a nurse log, today's dying hemlock trees will give rise to new forests to be explored and cherished. In these distressing situations, we feel that trees need us, but we should always keep in mind that it is we who need trees.

Anna Guerrero

Mid-Life Harvest 2016

Acrylic and Colored Pencil on Paper

When you think of major forest disturbances, you probably envision hurricanes, fires, blights, and drought. Did you include humans? People can dramatically alter a landscape, and often do so – to a similar and even greater degree than natural disturbance events. Through logging for wood products, farming, and development, humans have, and will, drastically alter forests in incredibly short amounts of time. The trees that are left behind are great recorders of disturbance that went on around them. Their annual growth rings grow thicker in good growing years with lots of light, water, and nutrients, and thinner in distressed years. A sudden loss of neighboring trees frees all these life-sustaining resources and triggers an abrupt and sustained increase in growth. Despite the ups and downs in growth, the rings come together to form a unique pattern and a telling story of the history of that particular tree, which in turn, may tell the story of an entire landscape.

Anna Guerrero

A Warm Welcome 2016

Acrylic and Colored Pencil on Paper

New trees, or seedlings, grow where the sun flecks the forest floor. In a dense, shady forest you will find few seedlings, but there are always openings being created in the roof of the forest. These openings can be quite small, appearing, maybe, when a single tree or branch falls. These openings can also be quite large, appearing, maybe, when an insect blight or windstorm wipes out acres of trees. These canopy-opening events, called disturbances, are hardly ever the end of the forest. They are simply part of forest dynamics. They continuously mold the forest into something new. Meanwhile, on the forest floor, seedlings are reaching and racing for the light, growing up and up, though only one out of every 100 will survive to become a tree.

Anna Guerrero

First to Fall 2016

Acrylic and Colored Pencil on Paper

100 years seems like a long time. For a human, it is not only a long time, but often all time. For most trees, 100 years is just the beginning. Determining the age of a tree can be a lot like determining the age of a person: a tree's bark and structure will change as it grows older. A common misconception is that you can tell the age of a tree by its size. The bigger the tree, the older it is, right? Very wrong. Some tree species grow quickly, some grow slowly, and even more important: individual size depends on the amount of sun, nutrients, water, and space a tree gets each year. The only way to know a tree's true age is to ask it: take a core, and count the rings. In the rings of the black gum tree depicted, you would' ' that despite its small size, this tree is already 100 years old – old in human y but well shy of black gums elsewhere in New England, which likely reac ,es upwards of 700 years. Black gum is one of the first trees to turn color in the fall, d the experience of bright reds, oranges, and yellows against green is striking.

Anna Guerrero

Arborpomorphic 2016

Acrylic and Colored Pencil on Paper

Trees DO make a noise when they fall and no one is around to hear it. The events reverberate in their rings. They do many of the things that people do, but in ways that we can hardly imagine. Most of a tree trunk is dead material. The only living part of the trunk is called the vascular cambium, a ring of cells that divide into xylem towards the core and phloem towards the bark. Xylem, or the woody inner part of a tree, pulls up water and nutrients from the ground. Phloem is a kind of tubing system that transports sugars and proteins throughout the tree. And while these tissues are important, the life of the tree is almost completely dependent upon the sliver of life-sustaining cambium. A small tear in the cambium all the way around a tree can cause the tree to die. The bark of the tree protects the living cambium from insects, infection, temperature, and harsh weather. Sudden or unseasonable freezes and ice storms can prove devastating for a tree. The tree's bark will become covered in an icy shell, and under the weight of the water, limbs and trunks may crack.

Anna Guerrero

Beware the Tempest 2016

Acrylic and Colored Pencil on Paper

One major type of forest disturbance in New England is a hurricane. In 1938, the Great Hurricane blew through several states, including Massachusetts, taking down 70 percent of the standing trees in its path. While large trees, with their massive roots, may seem safer in a powerful storm, their size and ability to catch wind makes them much more likely to fall. In 1938 it was, in fact, the smaller, more flexible trees, like the bending yellow birch here, that often survived. The tumbling beech, older yellow birch, and maple tree in this image will take c new and useful roles in their ecosystem as they move from the ca ; forest floor. Despite the startling destruction caused by a hurricane, new lig .l shine through, allowing seedlings and new plants to take root and thrive.