

Change Beneath the Surface: Maple trees responding to climate change

As temperatures rise and the growing season lasts longer, it's easy to see when trees are getting their leaves earlier, but what's going on with the trees? It's clear that something must be, to enable earlier leafing out and



later leaf-fall, but does that just mean that the whole process is shifted earlier? Fortunately, we have a window into the internal workings of deciduous trees, thanks to the maple sugar industry.

What are we watching?

Deciduous trees, like oaks and maples, not only drop their leaves in the fall, they also store nutrients and chemical energy in their root system below the frost line. In the spring, as the ground begins to



thaw and temperatures warm during the day, all that concentrated sap starts to flow back up the tree to start the process of leafing out for the season. Sugar maples (*Acer saccharum*) stores especially sweet sap, and *that* is what boils down into maple syrup.

Is anything changing?

While the movement of sap is triggered by the seasonal rise in temperature, maple farmers have known for years that the ideal conditions for sap flow are when the temperature is above freezing during the day, but below freezing at night. Temperatures all over New England have been pretty irregular in the spring over the past few years, with warm weather coming early and persisting. As a result, maple farmers are losing their crop. Maple trees are still leafing out and growing, but the conditions that create that sugary sap flow are changing, which points to changes going on inside the tree.

So what does this mean?

In terms of the tree itself, we just don't know what effect this has or will have either in the short term or in the long term. It's possible that it's damaging, but it's also possible that the trees are just fine. For humans, it's an easier question to answer. These changes mean that the maple sugar industry in New England is suffering, and will almost certainly be gone not far into the future, as the conditions required move north.

