Update from the Rotter-in-Chief

June was a very busy month collecting and processing samples from an experiment that is testing the differences in wood decomposition a stream channel versus on land. It all started the end of May when Randy Wildman and Stan Gregory (and several others) walked the Lookout Creek channel searching for tagged logs. They found 11 logs (we were hoping for 18), but it was amazing that they found them at all: some were high and dry in log jams in the side channels and others were sticking out of gravel bars. Interestingly, none of the alder logs we released 30 years ago were to be found. We suspect that they had decomposed away or at least enough that the stream would tear them to pieces. You would think that after 30 years and traveling down the stream channel close to a mile that the logs would be scattered about, but many of them ended up in the same places (see photo on right). In fact two logs that were placed in separate spots in 1985 ended up nestled side by side in 2015!

The second week of June was spent sampling these “aquatic” logs and the ones on land, referred to as the “terrestrial” logs. We had thought it would be easy to find the terrestrial logs because they did not move, but actually they were really very hard to find. The reason was that either they had decayed away in the case of alder or they were so overgrown with mosses, herbs, and shrubs that they melded into the green background of the forest floor-- hiding in plain sight so to speak. We had a very crude map to help search for the terrestrial logs and in some cases, particularly for alder, we thought we detected an “imaginary” log and sampled it. Our imagining was confirmed when we found the aluminum tags and nails where there was supposed to be an 8 foot long, 10 inch diameter log, now replaced by a smear (see photo on the right).

We also found some other interesting things. Some of the hemlock logs retained their bark, but the wood shrank away leaving the bark looking like an accordion. We knew that logs fragmented, but we did not realize they shriveled away too. In the stream we found logs that were entirely sound after 30 years and a stone’s throw away we found logs so rotten that one could put one’s hand through it. Pacific dampwood termites seem to like to eat the aquatic logs that are high and dry in side channels so this might explain the extremely rotten logs we found.

The work was not without its adventure. To remove the aquatic logs we had to bushwack through the dense forest because carrying a bunch of log cookies (the cross-sections we removed) on slippery rocks is a bit dicey.

Sometimes we needed to use a come-along to winch the logs embedded in gravel bars out. In one case we had a log drop into a huge cavern inside a gravel bar-log jam complex and had to hoist it out using our belts after one person (Jay Sexton) dropped into the vast hole. By the way, we found it is impossible to use a chainsaw to cut a floating log as it just goes round and round! When we tried to remove one aquatic log in a jam, a huge red cedar log threatened to wipe us out. So we left a little block of our sample log under the large log to avert disaster. If you find yourself at this place do not remove that block!

After extracting the cross-section samples from the field we spent two weeks processing them in the lab. While this was a long slog, it had its moments. We got a very close look at the shriveling logs and found the wood was turning into a white, cellulose pulp. After removing the bark you could see how the once round wood had peaks and valleys (see photo on the upper left). When there was a branch knot in this goo, it could be pulled out by hand and it was hard as a rock. Other cross-sections were mostly cubical brown material, most likely residual lignin and these held their shape, but flew into pieces when chiseled. And many of the decomposing stream logs were being consumed by termites, which can make short order out of any piece of wood. While most of the termites look like white ants, the soldiers have very long, dark brown pincers (but they don't seem use them to bite in the lab setting). I have a few sitting on my desk in vial as I write this (I am still deciding their ultimate fate). As we separated the cross-sections in to the various parts, we found a great many roots under the bark. In one case the roots were so dense one could detect the shape of the bark sample once the roots were separated out (see photo on the right).

All the samples have been dried and weighed and await grinding for chemical analysis.

On June 19th, a group of artists traveled up to the Andrews to visit the aquatic-terrestrial log experiment sites. The weather, in contrast to March was nice and dry and good time was had by one and all.

The next field trip will be in September, but given the severe fire danger in the woods this year this may have to be delayed until the fall rains come. That is also true for the next sampling effort which will sample the logs from the 200 year study. We also have found shrinking logs in that experiment. Aside from the concerns about fire danger, we are pondering how we will extract these large, mushy cross-sections intact from the forest and cut them up in the lab since we can't use a saw. Regarding the latter point, we have an effort to develop a wood guillotine of sorts to speed up the cutting.

Finally, in September I will be telling folks at the National Science Foundation about our efforts to develop the Rot Art show. Thanks for being a part of that.

Mark

Pacific dampwood termites turning a Douglas-fir log into soil. The white one is a nymph or worker, and the one with the brown head is a soldier. To the left of the termites is their building material, which turns out to be their feces.