Exploring the Effects of Wood Species on Water Filtration

Huet, Connor (School: Bend Science Station)
Huet, Tristan (School: Bend Science Station)

Clean drinking water is one of the most important requirements for survival and obtaining it can be a challenge if not impossible for many. One method of getting clean water is through filtration, either natural or synthetic, and after learning that wood can filter water, we wanted to know which type of wood or 3D printed filter cleans water the best? To accomplish this, we collected samples of 5 different wood types and designed/printed a synthetic filter from PLA. We then built a chamber with six 2 meter hoses each having a different filter. The chamber held our ~100 ntu water/flour mixture that was agitated with a magnetic stir bar. After filtering ~1 hour, we tested the turbidity of each sample and analyzed the data. Ponderosa Pine, with an average percent decrease in turbidity of 86.8%, and White Pine with 87.6%, were significantly more effective at filtering water than Hemlock, Silver Fir and Douglas Fir. These three wood species, which had average percent turbidity decreases of 54.8%, 56.3% and 44.4%, respectively, were significantly more effective at filtering water than our 3D printed filter which averaged 8.8%. Of the species we tested, White Pine and Ponderosa Pine were the most effective and cost efficient wood filters.