

Abstract for TFISE Poster

Poster Title: Modeling the relationship between below ground and above ground biomass of Black cohosh

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Abstract:

Non-timber forest products are widely used and loosely regulated in terms of how much biomass can be harvested from wild populations. Forest management primarily focuses on timber because non-timber forest products have not been extensively studied or modeled. In 2005, two long-term study sites were established near Reddish Knob and Mount Rogers, Virginia, to study the sustainable harvest of Black cohosh (*Actaea racemosa*). The roots and rhizomes of this native Appalachian herb are used commercially to treat menopause symptoms, with nearly all harvested Black cohosh coming from natural populations. To simulate practices of local harvesters, the largest plants from plots were harvested and measurements of both above ground and below ground biomass were recorded. The objective of the current analysis was to model the relationship between above ground and below ground measures in hopes of providing forest managers with a practical tool to predict yield. A linear mixed effects model was used to account for different levels of variation from the nested experimental design and provide proper estimates of uncertainty. We found that log root weight increases on average by 0.82 (0.64, 1.00) and 0.46 (0.25, 0.67) grams for each unit change in log maximum crown area (m²) and plant height (cm), respectively. Furthermore, variance components indicated that variations between plants within a plot were much larger than variations between different plots within or across the two sites. In future work, we will use data from three new study sites to validate the current model and determine its predictive ability.