NARA Research Briefs

Dr. Kevin Boston, Oregon State University
Estimating Biomass Availability

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Researchers, such as Oregon State University Professor and NARA investigator Dr. Kevin Boston, are asking questions concerning the availability and location of forest residual biomass across a wide variety of forested regions. In a recent interview, Boston describes his work with NARA as involving new strategies for answering this question of availability. “First we asked how do we measure a biomass pile? We found LiDAR to be effective but very costly and time intensive. Since current geometric methods did not seem refined enough for our estimates, myself and a research assistant used a laser to make an approximation.” LiDAR is a type of remote sensing technology measuring distance by analyzing reflected light from laser readings. Typically used to measure tree heights, Boston’s simple laser method provides estimates very similar to that of LiDAR. By recording data points on biomass piles, a digital 3-dimensional figure can be created and used for calculating volume. Although current geometric methods project shapes, user inputs are biased therefore making sampling methodologies difficult to regulate. So with the use of Boston’s laser, biomass has the potential to be more easily identified and calculated. However, one might beg the question; how does a forester or researcher find these piles post-harvest?

The entire biomass supply chain would not be possible without obtaining harvest residues. By pairing Boston’s availability estimations with maps and GPS data points, foresters and researchers will spend less time searching for material. Boston also mentions that with the addition of current NARA research concerning predictive modeling of regional pile location, the potential for more accurate information will greatly increase. “The combination of our work on pile estimations plus research on locations will be a great result coming out of NARA” stated Boston. Not only are his methodologies proving to be helpful for utilization efforts, nutrient cycle modeling and volumetric equations are proving to be other beneficial relationships related to evaluating forest nutrients as well as the amount of residues left behind.

When questioned about what future goals he has for NARA and his research, Boston stated “I hope we get to a point where the research has matured enough so we might share it with others who could benefit and improve upon it.” By sharing information, the potential for this and other research will likely climb borders into an international market arena where

techniques such as this may be useful to organizations located outside of the United States. “I believe the next few publications will prove to have a strong international appeal. They will explain how we express available biomass in a way that could be economically viable” stated Boston. Additionally, there are also benefits outside of decreasing transportation and location costs for biomass. “For me, the part I always enjoy, is working with and mentoring students to become effective employees for future applications. By working with students on my NARA research, I can provide them with both quantitative and qualitative skills to be successful in their chosen careers” said Boston. Determining solutions to bottleneck issues such as biomass availability and location begin to fill in the missing gaps of the full transportation system. As research continues, the entire supply chain will continue to be pieced together creating both a better understanding of what residues are available and how best to make these materials an effective and more cost efficient fuel alternative.

Works Cited

Boston, Dr. Kevin. (2014, April 16). Personal Interview.