

## Monitoring Urban Trees: Survival, growth, and energy-saving performance

Wednesday, March 9, 2016 | 1:00 – 2:15pm ET

### Q&A

Would the soil types make much of a difference when considering the study?

*Pete Smith:* We did not take soil types into account in the Houston-area analysis. But I have some doubt that native soil type would have much impact on survival after just one growing season. In addition, many of these yards represent “urban” soil conditions that don’t really reflect the soil survey.

*Lara Roman:* Soil samples were not taken for the Sacramento studies either. Certainly soil conditions matter to plant establishment survival as well as long-term survival and growth, but we didn’t have the project budget for soil lab work.

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Did you consider areas of higher income would probably consume more water for plants?

*Pete Smith:* No, we did not overlay any sort of household income data over the properties in Houston. We were very simply trying to understand first-year survival for trees received by those willing recipients. I will add that Houston had one of the wettest springs on record, so household water use may not have been a factor in 2015.

*Lara Roman:* The situation is a bit more complicated in Sacramento. The utility SMUD has only installed metered water over the past few years – so until very recently households were not charged for water use by amount used. That said, even with metered water fees, I wouldn’t necessarily expect higher income households to water better. Perhaps such households would water more but it might not be appropriate watering for trees (i.e., could be lawn-style sprinkler system not drip irrigation).

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What percentage of people opted out? Do you think this added bias?

*Pete Smith:* Thirty one trees out of 320 were “unobservable” in the Houston study. It’s hard to see a pattern in those “declining” participation, since sometimes it was the result of no contact, in others, the site was under construction (yes, some recipients accepted trees for houses not yet built). We based our analysis on the remaining 289 trees and have no reason to think the declined trees were anything other than random.

*Lara Roman:* In the 5-year Sacramento study, 8 households out of over 400 opted out. Another 12 were inaccessible in the last year of the study (although I had some data for those households in earlier years when they let me into the yard). This may have introduced bias but it is a small fraction of the total. I do think that earlier SMUD survival numbers have bias problems since so many backyard trees were recorded as “hidden” and excluded from survival calculations. To keep that bias to a minimum, I visited households up to 3 times, including weekends, plus phone calls and a mailed letter. So the opt-outs and inaccessible homes were kept to the absolute smallest feasible number. It took a lot of time but gives me strong confidence in our survival numbers.

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In the Houston example, which trees were more successful - those delivered directly to homes or those picked up at nurseries (perhaps with some training/education)?

*Pete Smith:* In the Houston program, all trees were picked up by recipients at a single pick-up event in March 2015. We hope to conduct a similar analysis of the direct-delivery model in the near future, but the product is also different in these cases.

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What type of trees were surviving better?

*Pete Smith:* I don’t know what we can really learn about any differences in species with this dataset. Remember, a significant number of trees were planted elsewhere or given away; did owners do that randomly, or did they have a bias for “gift-giving?” From all appearances, the quality of trees provided was similar, regardless of species, although I suspect that any differences in survival by species would stem from differences in nursery material, first and foremost.

*Lara Roman:* In the 5-year Sacramento study, trees that were more drought tolerant had better 5-year survival. Tree species were classified in this way according to the Water Use Classification System for CA, which lists species according to water use demand in regions of the state. However, drought tolerance didn’t appear as important with the 22-year Sacramento study. In that study, tree size class was more important for long-term survival. So, these two ways of classifying species (drought tolerance and mature tree size) seem like they might predict survival but I wouldn’t say results are conclusive across other urban tree survival studies. I also echo Pete’s response that the issue of

failure to plant is not likely to be something that's related to tree type.... Only post-planting survival would be reasonably related to tree type.

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Would it make sense to encourage tree recipients to plant in their front yards as it encourages better management as well as monitoring?

*Pete Smith:* It definitely would make it easier for monitoring (and from Lara and Yekang's work, the expected stewardship might be greater), but if the program goal is energy savings then I'd say some of those best locations might be in the backyard.

*Lara Roman:* I agree with Pete's response. There are advantages to front yards but a) back yards might be the only location available to plant for some households, and b) back yards might be the better location for tree shade.

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