### Hashtags: #earth, #treefactor

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### Tags: Imagery

**Challenge Description**

Many apps exist that help map trees, biodiversity, and pests. However, basic tree size and condition still needs human input which can be used in modeling ecosystem service values of trees and forest cover, especially in urban settings such as along streets, people’s backyards or pocket parks. The U.S. Forest Service has developed allometric models that use input about trees to compute ecosystem service values – but these need basic ground-based input about the trees.

This is your opportunity to design tools for capturing input on trees in any community that can enable better analysis for scientists and tree enthusiasts. Analysis examples include comparing a tree’s health to local factors (environmental or socioeconomic) that could affect individual trees, or to the percent of permeable surface near the tree. You could also compare tree growth to population density and other socioeconomic data that are available through US census reports and other sources.

**Background**

While tree diameter is something that can be reliably assessed where trees are accessible, tree height and tree condition are values that are particularly problematic for people to reliably assess without technology.

**Solution Ideas**

Here are some ways for you to frame this solution:

Consider developing a way to use a smartphone camera to quantitatively assess the height of a tree, diameter of a tree, tree condition, and the percent permeable surface around the tree where users could enter other tree data, such as species, manually; collect measurements over time would illustrate tree growth as determined by increasing height and diameter; present the tree data and the potential affecting factors together to identify patterns. This data could feed into the U.S. Forest Service models that equate tree size and condition to ecosystem services. Socioeconomic data are available from U.S. Census.

**Sample Resources**

* <http://www.census.gov/popest/data/index.html>
* <http://www.census.gov/main/www/access.html>
* <http://apps.fs.fed.us/fiadb-downloads/datamart.html>
* <http://www.fia.fs.fed.us/library/database-documentation/current/ver5.1.6/FIADB_user%20manual_5-1-6_p2_7_12_2013_all.pdf>
* <http://www.epa.gov/greenapps/existing_apps.html?appSearch=tree>