Using a citizen science tool to model the health benefits of roadside trees

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Using a citizen science tool to model the health benefits of roadside trees

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Health effects of air pollution

Cardiovascular and pulmonary diseases linked to transportation

40,000 deaths
20 billion pounds
Roadside trees improve the urban environment

- Provide shade
- Slow cars down
- Reduce the urban heat island effect
- Filter air pollution
Previous studies on trees and particulate matter

- i-Tree Eco (Rogers et al., 2015)
- Remote sensing (Tallis et al., 2011)
Valuing trees the citizen science way

• OpenTreeMap: learning about the value of individual trees

• Treezilla: developing a ‘monster map of trees’ for GB
Project VITAL: Valuing Green Infrastructure Through Tree Assessment Tools

We're making a monster map of Britain's trees. Use Treezilla to record the trees near you and to find out how they benefit the local environment.

[Buttons: Get started, map and measure a tree today. Learn how to use Treezilla]

www.treezilla.org
Benefits of a citizen science approach

Treezilla.org is a platform that can help:

• Highlight the role of trees in urban environments and the ecosystem services they provide
• Help the general public learn and contribute
• Acknowledge this contribution and its role in the care and welfare of trees
Add a New Tree

Step 1 Enter an address

High Street

Step 2 Specify Placement

Select coordinates to record it in the correct location.

White willow:

- Species name: Salix alba
- Common name: White willow
- Tree number: #29461
- Nearby address: 388 Salisbury Road
- Tree diameter: 0.65 metres
- Tree height: Unknown
- Last updated: 01 Jun 2013
- Admin: No admin
- Year since impact: £100.58

View all details
Edit details
Using Treezilla to study the removal of PM$_{10}$ by roadside trees
Grid roads and their trees

- Milton Keynes: a new town planned with a network of grid roads

- Unintended benefits of ‘screening’ the roads
Grid road trees mapped: ~430ha within 50m of carriageway
Proportion of PM$_{10}$ removal by 8 most common species
PM$_{10}$ removal across MK

- 22.36 kg/ha
- 9.6 tonnes overall for the planted area of grid roads in MK
- 5.5-6.3% of estimated annual exposure for the high and low pollution scenarios respectively
Managing roadside trees

Thinning to:

• Promote larger trees

• Improve visual amenity

• Increase ground flora diversity
Effects of thinning on PM$_{10}$ removal
Value of pollution reduction

In Treezilla:
• £14,568 under current conditions;
• £12,998 under the thinning scenario.

By UK government figures:
• £637,115 under current conditions;
• £568,445 under the thinning scenario.
Challenges

• Mapping at street level difficult with consumer GPS

• Co-ordinating citizen scientists at scale

• Which figures to believe: PM$_{10}$ and £££?
Conclusion

• A citizen science tool can provide sensible ball-park estimates of PM$_{10}$ removal.

• Uncertainties remain over precision of estimates and associated valuations.
  
  But these are not specific to the citizen science approach

• Future developments will enhance the ability of Treezilla to contribute to baseline assessments and decisions over management.
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The Parks Trust

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