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

Conference or Workshop Item

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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.

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

1 High Road

City

Step 2 Specify Placement

Click to drag the orange dots to move it to the correct location.

White willow

Species name: Salix alba
Common name: White willow
Taxon number: e29466
Nearby address: 386, Sidney Road
Trunk diameter: 0.65 metres
Free height: Unknown
Last updated: 07 Jun 2013
Ailms: No Ailms
Yearly rate impact: £190.58

View all details
Edit details

Get started, map and measure a tree today

Learn how to use Treezilla

The OpenScience Laboratory
An initiative of The Open University and The Wellcome Trust
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.
Acknowledgements

Project team

Project partners

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