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Trees are very, very good for our health. But in many cities, they're struggling

By **Chris Mooney** June 17 at 12:29 PM

It's a huge paradox.

More and more research has been pouring forth lately demonstrating just how valuable trees in urban areas are to human health and well-being. A new study by U.S. Forest Service and University of California at Davis researchers underscores the point. They find that California's 9.1 million urban street trees are worth \$1 billion in benefits per year to humans, in ways ranging from providing shade and pulling pollution out of the air, to retaining storm water and driving up real estate values.

"Given an average annual per-tree management cost of \$19.00, \$5.82 in benefit is returned for every \$1 spent," the study concluded. It was published this week in the journal *Urban Forestry & Urban Greening*.

Yet the very same study finds that despite these large benefits, city streets in California are far from flush with trees — they're only at a little over a third of what would amount to "full stocking." This means people are reaping far fewer benefits from trees than they could. Even worse, it found that while total tree numbers grew, the density of street trees is actually in decline in the state over time.

Between 1988 and 2014, the density of trees along California streets slumped 30 percent, from 65.6 trees per kilometer to 46.6 per kilometer. What that implies, essentially, is that along existing California streets, more trees died or were removed than were replaced — or, along new streets, fewer trees were planted.

“There’s a disconnect between what the science is telling us and the investments we’re making,” said Gregory McPherson, a researcher with the Forest Service’s Pacific Southwest Research Station in Davis, Calif., and lead author of the study. He added that on the benefits side of the ledger, the numbers above are probably an underestimate, because the study did not include the clear and well-documented psychological benefits to humans from being around nature.

It’s far from clear whether, when it comes to a decline in the density of street trees, California’s cities are fully representative of the rest of the United States. A [2012 study](#), also by Forest Service researchers, found a similar-sounding trend of declining overall tree cover (encompassing all urban trees, not just street trees) in a sample of 20 U.S. cities. It also found an increasing trend toward hard surfaces such as asphalt.

On the other hand, Richard Hauer, a professor of urban forestry at the University of Wisconsin at Stevens Point, says his research has found slightly more public trees being planted than removed in most of the country’s urban areas. But that was paired with a clear downturn in the Midwest tied to the devastating impact of the emerald ash borer, an invasive species that has single-handedly taken out millions of U.S. trees, according to [recent research](#).

“Overall, it’s tough to make a general statement” about tree trends, Hauer said, simply because cities and regions of the United States are so different.

But in some cases, as with the cities and states affected by the emerald ash borer, the news is quite bad indeed. Here, tree damage has apparently been so sweeping that it has actually harmed humans, too — apparently by taking away key pollution protection once afforded by trees.

“In the Midwest, where we’ve lost more trees than we replaced, they discovered in Ohio that [the death rate has actually increased as emerald ash borer has progressed in an area](#),” Hauer said. “The trees are taking up particulate matter . . . so the average person, if you’re healthy, it’s not going to have much of an effect, but if you have a complicated health situation, this could be the thing that puts you over the edge.”

Granted, there are also some clear urban tree bright spots — including Washington, D.C., where advocates with the group Casey Trees helped galvanize the planting of [over 12,000 trees last year](#) in a quest to reach an overall 40 percent tree canopy. The goal is to reverse a [historic decline](#) in D.C.’s tree cover from the 1950s to the 2000s.

So while overall trends aren’t entirely clear for U.S. urban or street trees, and while not every place presents a negative story, it’s still fair to say that there’s a disconnect. It simply consists of more and more research

documenting trees' overwhelming benefits, paired with a mixed picture of city investment in maintaining and expanding them. Not that this is entirely to be blamed on often cash-tight municipalities, to be sure – and disasters like the emerald ash borer are not easily fought off or recovered from.

Still, some things are in cities' hands – so why the disconnect?

McPherson said that for California, he can think of at least three reasons that trees might actually be growing less dense in cities, at least along streets (the study did not look at urban trees in parks, yards or other locations). One would be that in long-established cities, more trees are being removed – because they have died or fallen – than are being replaced. It is, after all, expensive for municipalities to tend to and plant new trees, and despite long-term benefits, present-day costs loom large.

“From the ledger point of view, planting and maintaining trees along city streets and parks, it's a cost center,” McPherson said.

McPherson's Forest Service colleague and co-author Natalie van Doorn added, for instance, that even the city of Claremont, Calif. – an exemplar that works very hard to tend to its trees – was still failing to keep up with losses in recent years. “They were planting around 100 per year,” van Doorn said, based on research up through 2014. “So removing about 200 to 300 per year and only planting 100 per year.”

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And then there are the expanding areas, or the newer urban areas – where tree installation may be falling behind overall growth. “They may be developing new streets and not planting them in a pace that's keeping up with what was there previously,” McPherson said.

Finally, there's a third problem, already alluded to – tree-killing invasive species that are taking a greater and greater toll. “We have an ever-increasing array of pests and trees that are afflicting trees in cities, associated with global trade,” McPherson said. He pointed again to Claremont, where a tree disease was killing off common sweetgum trees, leading to large removals.

The new study found that one common weakness in the street tree regime is that the trees in a given city often aren't diverse enough – too many tend to be of the same species, which can make the host of trees vulnerable to new, introduced diseases.

Overall, then, we live at a time when the benefits of living around trees are becoming increasingly well documented — but when actually acting to realize those benefits isn't always easy.

"Typically, for every buck we invest in a tree, we get about two to three dollars returned over the life span of a tree," Hauer said.

Chris Mooney reports on science and the environment.  Follow @chriscmooney