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Olympic torch's ripple effect

by *Edie Lau* -- *Bee Science Writer*

Relevance: Greg McPherson, director of the Center for Urban Forest Research based at UC Davis, says it would take 122,000 mature trees one year to sop up the carbon dioxide and nitrogen dioxide emitted by the Olympic torch's world tour.

It seems a perfectly innocent object, even virtuous: a single flame symbolizing global sportsmanship and the quest for athletic excellence.

But like almost all objects of modern society, the Olympic torch makes pollution.

Just how much pollution is the subject of a curious study by a forester in Davis.

Invited by a Greek environmental group to run the calculation, **U.S. Forest Service researcher Greg McPherson** concluded it would take 122,000 mature trees one year to sop up the carbon dioxide and nitrogen dioxide emitted by the torch's world tour leading to the 2004 Olympic Games in Athens.

"Wow," said Cory Macartney, program director of the Athens Environmental Foundation, which requested the research. "It's kind of staggering."

It's not that one flame burns so much fuel, or that runners breathe so heavily. The emissions come from all the engines fired up to support the torch on its odyssey.

There are police motorcycles escorting the torch runners. There are vans, sedans and SUVs carrying a support crew of 100 to 200 people. And, most significantly, there's a jet plane that stops in 32 cities on five continents, covering 50,000 miles.

The happy news is that the Athens Environmental Foundation, which has offices in Emeryville as well as Athens, has arranged for the planting of more than enough trees to offset the emissions.

In a project dubbed Global Olive Wreath, the foundation has secured pledges from individuals and institutions around the world to plant more than 4 million trees as a living tribute to this year's Summer Olympics.

In honor of the Olympics returning to its birthplace, the foundation asks that the trees be olive wherever possible, creating a wreath encircling the Earth similar to the olive-branch wreaths that crowned Olympic champions of ancient Greece.

If 4 million trees are planted, they will absorb emissions produced by the torch run 32 times over, each year. But not right away. The calculation was based on the ability of 20-year-old trees to soak up pollutants.

Why 20 years old? That was just one of the arbitrary decisions McPherson had to make for a calculation that he thought at first would involve a few simple equations on the back of an envelope.

The job was more involved.

First, he had to map the journey and find out what vehicles were involved. The answer: eight mid-size sedans, eight vans, six full-size sport-utility vehicles, six motorcycles and an airplane.

He also had to decide which pollutants to track. McPherson picked carbon dioxide, a greenhouse gas associated with climate change, because of trees' vaunted ability to store carbon. He also picked nitrogen dioxide, a precursor of ozone pollution.

To figure airplane emissions, McPherson dug up an Italian study that measured the pollutants produced by a Boeing jet.

The task wasn't as straightforward as multiplying the amount of emissions produced at cruising altitude by the miles

traveled.

"They estimate that there's 19 minutes while the plane is idling and taxiing, and then, like, 42 seconds during the takeoff, and then a couple of minutes for when it's climbing, and at the other end, they estimate four minutes for approaching landing and seven minutes for taxiing and idling," McPherson recounted.

"At each of those steps, there's a different amount of fuel consumed, and a different amount of emissions produced."

Goaded by his science training to be exact, and wishing to produce a study worthy of publication, McPherson gamely did the numbers for each leg of the trip.

Next came the motor vehicles. Striving for authenticity, McPherson figured in stops for breakfast, side trips for errands and the like.

Again, there were different emission factors depending on speed and whether an engine was started cold or warm.

"This is not my area of expertise," said **McPherson, who is director of the Center for Urban Forest Research in Davis**. "I'm really a tree guy."

The tree part came next. McPherson ran calculations on small trees (20-to 30-feet high at maturity), medium trees (30 to 40 feet) and largetrees (50 feet and up), using growth rates for four geographic regions.

Generally speaking, the larger the tree, the greater its ability to take up pollutants. Again for authenticity, he assumed about a quarter of the trees would die.

The exercise took about two months, all for no pay.

That was consistent with the volunteer nature of the Global Wreath Project, the brainchild of Tony Diamantidis, a Greek immigrant who owns an East Bay chemical safety software company.

Diamantidis founded the Athens Environmental Foundation to help his homeland highlight environmental conservation during the 2004 Olympic Games.

"If those trees are planted, they could be a real legacy for the Games and for the torch relay," McPherson said.

Many of the trees are in the ground. The foundation organized a mass international planting by schoolchildren in April.

One of the schools taking part was Pleasant Grove School in El Dorado County, which held an assembly featuring Debbie Meyer, a Sacramento swimmer who won three gold medals at the 1968 Olympic Games.

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