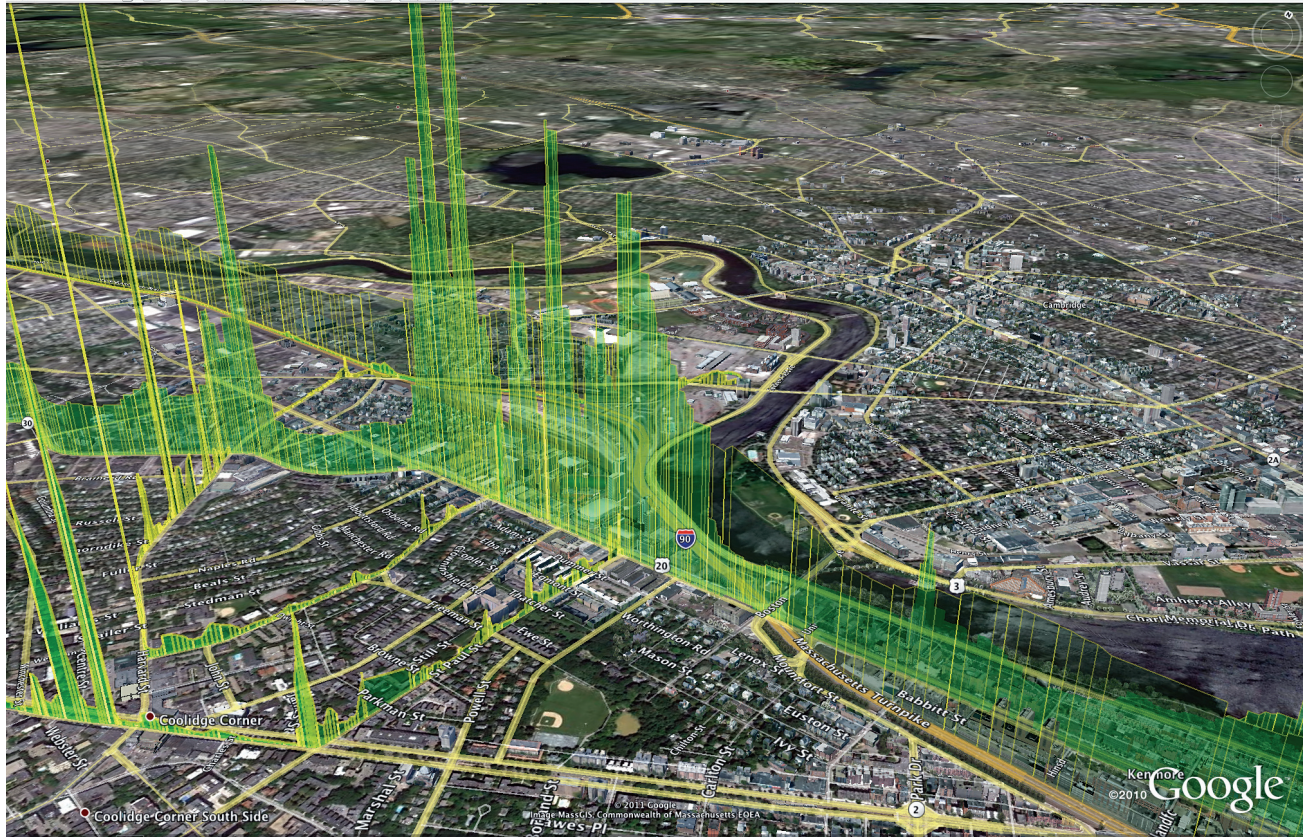


Natural Gas Leaks Fuel Global Warming, Not Homes



BU RESEARCHER MAPS GAS LEAKS ON CITY STREETS

BY RICH BARLOW

NATHAN PHILLIPS IS a meter-reader for the 21st century. The College of Arts & Sciences associate professor of geography and environment recently piled into a Nissan Murano with collaborators Bob Ackley and Eric Crosson and rambled through the streets of greater Boston to hunt for natural gas leaks. With the help of a strange-looking vacuum device attached to the car just below the rear bumper, the

three have found geysers of gas gushing invisibly from underground pipes corroded by age. The leaks, Phillips says, contribute to global warming, could create explosions in some extreme cases, have killed or damaged up to 10,000 trees in Massachusetts (a disputed matter under litigation), and shaft rate-paying gas customers who must pick up the tab for wasted gas.

The vacuum sniffs up

molecules into a suitcase-sized machine in the hatch called a cavity ringdown analyzer, where a laser beam ricochets off mirrors and through the collected particles. The more natural gas collected, the more the laser diminishes. When the machine detects a leak, numerical values on a display screen indicate how much gas is spurting; if there are multiple leaks, the display “looks like a stock market index during

a busy day,” says Phillips. The machine instantly spits out the leaks’ locations and shows them on Google Earth maps as shafts of green, punching skyward like a light show.

There are a lot of leaks. One utility, National Grid, counts 14,000 in its system, which serves half of the Bay State, while Ackley, president of Gas Safety USA, a Massachusetts leak-detection company, puts the figure for all leaks at up to

◀ **GOING UP** A display screen indicates how much gas is spurting; if there are multiple leaks, the display “looks like a stock market index during a busy day,” says Nathan Phillips.

30,000. Utilities reported 13.5 million cubic feet of gas lost from leaks throughout Massachusetts in 2009, an amount that is surely an undercount, according to the federal government, which collects the data.

In May, Phillips and company found a leak in Newton that was spewing 400 cubic feet of gas per day. “The average household uses about 200 cubic feet per day,” says Crosson, whose California company, Picarro, makes the analyzer. “So that leak was equivalent to two households opening up their gas stoves and heater without igniting them.”

The perils and price of leaking gas are the subject of a paper that Phillips, Crosson, and Ackley presented at a spring conference sponsored by the National Oceanic and Atmospheric Administration. Their research suggests that 7 percent to 15 percent of manmade methane (the main component of natural gas) in the atmosphere comes from these urban emissions. And that’s a problem: methane is a greenhouse gas that according to the United Nations is 21 times more potent than carbon dioxide at trapping heat in the atmosphere.

Then there’s the money. The eight billion cubic feet

of gas vented in Massachusetts in 2005 (that’s leaks plus gas unaccounted for because of other factors) was worth \$41 million, and that annual leak of gas and dollars continues. Gas customers pay a monthly maintenance charge already, in addition to being charged for the gas that leaks away, says Ackley, who for years worked to detect leaks for National Grid and other utilities. He estimates that leaks could add \$40 a year to the average Bay State residential gas bill.

Leaking gas also kills or damages millions of dollars worth of urban trees—between \$15 million and \$25 million just in the commonwealth alone, says Ackley, who with Jan Schlichtmann (the lawyer hero of the book and film *A Civil Action*) runs the Massachusetts Public Shade Tree Trust, which seeks damages from utilities for affected municipalities.

Brookline is suing National Grid, which serves 1.2 million customers there and throughout Massachusetts, for damages to town trees allegedly caused by gas. Company spokesman David Graves says he can’t comment on pending litigation, but he does say that there is no scientific evidence supporting claims that underground gas leaks cause widespread damage to trees. “We work with



↑ **LOOKING FOR TROUBLE** Nathan Phillips (left) and Eric Crosson check a display screen indicating the extent of a natural gas leak. One utility, National Grid, counts 14,000 leaks in its system, which serves half of Massachusetts.

communities on individual cases where they believe gas may have damaged a tree,” he says. “If we can prove gas is responsible, we replace the tree at our cost.”

Graves says his company takes the leaks issue very seriously and responds to every reported odor of gas. “We are in complete compliance with state and federal standards in leak management,” he says.

Phillips says utilities triage their repairs to remedy catastrophic leaks, such as the one that occurred near San Francisco last year, when a gas transmitting line exploded, killing four and torching dozens of homes. He found one leak in West Newton, Mass., with methane levels that would rate as potentially explosive.

By contrast, Phillips says, slower street-level leaks are bottom-tier concerns for repair, even though pedestrians occasionally can smell the gas.

Ackley tracked gas leaks for years before teaming with Phillips, whom he met by chance. Walking with his toddler son in their Newton neighborhood, Phillips spied Ackley in a yard wielding a strange handheld device. Curious, he asked Ackley what he was doing.

Picarro’s machine has revolutionized the labor of leak detection since Phillips and Ackley began using it last winter. “I can find the leaks with the old-school equipment we’ve been using in the gas industry for years,” says Ackley, “but this equipment is much more sensitive, and it has the ability to map out on GPS, right on a computer screen,” a leak’s location, “and also quantify the gas a little bit better.” The machine can sense leaks at any car speed, Crosson adds. “I’ve done it doing 65 miles an hour.”

So far, Crosson, Phillips, and Ackley have surveyed only a small percentage of Boston streets, and they plan to publish more comprehensive leak data from the city.

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