Forest fires release more mercury into the atmosphere than previously recognized, a multidisciplinary research project at the University of Michigan suggests.

"There I was, watching forest fires around our field camp, and it seemed like the ideal place to study the problem," he said. Over the next two summers, under the direction of U-M professor Joel Blum, Biswas collected core samples of forest soil from burned and unburned areas, using sections of PVC pipe sharpened at one end to obtain the cylindrical samples. He and Blum also collaborated with U-M professor Gerald Keeler and former research scientist Bjorn Klaue to take air samples at Camp Davis—measuring mercury and trace metals over two summers—which provided the scientists with a picture of the atmospheric background on which the fires were superimposed.

"For example, the researchers could estimate how much mercury was released when forests burned. They found that both the type of fires in the forest and the severity of the fire affected the amount of mercury released. The type of tree makes a difference because evergreens take up more mercury from the atmosphere on their needles than do broad-leaved trees, leading to more mercury accumulation in the soil prior to the fire. The findings also have implications for forest fire management, Biswas said. "When you let fires run free in an area where they have been suppressed for a long time, as happened in the Yellowstone fire of 1988, the fires end up burning a huge area that has been accumulating mercury for a long time, so a lot of mercury is released. By contrast, when you allow fires to occur in natural 50- to 100-year cycles, you end up with more frequent, less severe fires, which release less of the mercury in the soil. So the current shift in management practices from suppressing fires to letting some of them burn suggests that in the immediate future there may be a lot of high mercury release fires, but that down the road the amount of mercury released from these fires should drop." 

In a related project, the researchers are trying to identify the sources of the atmospheric mercury that ended up in the forest sites they studied. Preliminary results suggest that much of it came from mining operations in the western United States. Studies of the sources and fate of mercury pollution are critical, Blum said, because it's a problem that won't go away. "Once mercury starts getting emitted and deposited into a forest, it then gets re-emitted and redeposited and re-emitted again. So the legacy of mercury pollution will be with us for a very long time." 

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