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Limited retention of wildfire-derived pollutants in indoor environments

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Wildfires and fires at the wildland-urban interface emit large quantities of persistent organic and inorganic pollutants. Recent fires have caused elevated concerns that residual pollutants in indoor environments pose a long-term health hazard to residents, however, to date no studies have investigated how long fire-derived pollutants are retained in indoor environments over an extended period of time, and if they pose a long-term health hazard to returning residents. Here, we quantified the concentrations of 14 polycyclic aromatic hydrocarbons (PAHs) and 12 toxic trace elements in ground ashes collected during major wildland-urban interface fires in Fort McMurray (Alberta, Canada) in 2016 and in house dust samples that were collected from 64 homes 14 months after the fires. Overall, pollutant concentrations were equal or lower than in other locations unaffected by wildfires, but exhibited large house-to-house variance. We distinguish between two distinct pollutant sources: local building fires and regional forest fires. We document residual arsenic pollution from local building fires, as evidenced by higher concentrations in neighborhoods with building fires compared to other neighborhoods. In contrast, we found no evidence that forest fire ash remained in households 14 months after the fire, as pollutant concentrations were lower than in background studies, and were not correlated to tracers of biomass burning (retene and K/Na). Given the current and future concerns over wildfire impacts, this our results provides importance evidence on the degree of their long-term effects on the residential environment.