

# Unreported releases from coal ash ponds may be more widespread in US than previously known

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Researchers from Duke and Appalachian State Universities have discovered previously unreported spills of coal ash in a recreational lake near the coastal city of Wilmington, North Carolina.

The spills in Sutton Lake are associated with the now-closed Sutton Steam Plant, operated by Duke Energy. When it was operational, the lake was formerly used as a cooling reservoir for the facility. These spills are in addition to the known incident which occurred last September during Hurricane Florence, after a dam breach flooded the area, spilling tens of thousands of tons of coal ash.

Coal ash is a toxic waste produced by coal-fired boilers at power plants and other industrial sites. It is known to contain metals such as arsenic, selenium, copper, antimony, nickel, cadmium, vanadium, radium and thallium, which have known ecological and health impacts. Exposure can affect the kidneys, liver, skin, lung, breast, bladder and cause bone cancers, leukemia and nervous system and brain damage.

Coal ash has a distinctive strontium isotopic fingerprint and an elevated magnetic susceptibility resulting from combustion of iron pyrite-containing coals. Therefore, the positive identification of coal ash-contaminated sediment layers in lakes and rivers is possible through chemical, isotopic and magnetic analyses.

Multiple layers of such enrichments were found in 9 sediment cores taken by the Duke/ASU research team in 2015 and 2018 throughout Sutton Lake, which is adjacent to three coal ash ponds and the Cape Fear River upstream of Wilmington. Metal concentrations in Sutton Lake sediments collected in 2015 and 2018 were enriched by one to two orders of magnitude compared

to their concentrations in a reference lake used as a control by the study.

The Sutton Lake samples exceeded EPA ecological screening standards for sediments. These sediments showed similarly high heavy metals content, indicating mobilization and release to the environment via the overlying water column.

The concentration of toxic metals in the affected Sutton Lake sediments was similar to those in stream sediments impacted by the 2008 Tennessee Valley Authority spill in Kingston, Tennessee (the largest in US history, which released 4.1 million cubic meters of ash), and the 2014 Duke Energy Dan River, North Carolina coal ash spill, the third largest in US history, which coated 70 miles of the river bed in toxic residues.

The spills occurred in spite of a court ruling in November of 2014 which ruled that Sutton Lake is a "Water of the United States," meaning it was subject to more stringent federal inspections.

These results indicate that the dispersion of toxic, heavy-metal laden coal ash residues may be far more widespread and frequent than previously realized, putting nearby communities, which are often low-income, and their drinking water supplies in jeopardy. Leakage from unlined ponds (95 percent are unlined), permitted or unpermitted intentional discharge from ponds, and runoff from surrounding coal-waste piles are thus continual sources of pollution in addition to episodic waste pond failures.

Of the greater than 100 million tons of coal ash generated annually in the US, about half is reused, mostly by the cement industry, while the remainder is stored in open impoundments and landfills, many of which are no longer associated with active plants, but

remain a threat for contaminant release. EPA regulations contain a loophole exempting “legacy” coal ash ponds located at power plants which closed before October 2015. These “legacy” ponds are not included in government data. Neither state nor federal regulatory agencies perform regular testing or inspection of most coal ash facilities.

The most common cause of major spills of coal ash is impoundment dam failure due to a combination of inadequate/improper design and extreme weather events. The Environmental Protection Agency has deemed 7 of 14 coal ash sites in North Carolina “highly hazardous,” the highest in the southeastern United States. The southeast US as a whole is home to 17 high hazard facilities and 20 significant hazard facilities.

Environmental nonprofit Earthjustice reported in 2015 that at least 70 power plants in 22 states failed EPA groundwater standards for contaminants including arsenic, chromium, lead, selenium and radium. Since 2015, additional reporting reveals that 91 percent of plants in 43 states are contaminating groundwater with toxic substances at levels exceeding federal safe standards.

Earthjustice reported higher-than-average proportions of minority and low-income residents near six of the 10 most contaminated sites in the country. New Hanover County, where Sutton Lake sits, has a poverty rate of 18 percent. The number of people nationwide potentially affected by coal ash contamination of drinking water is unknown, but likely in the millions, especially east of the Mississippi, where the concentrations of coal plants are greatest.

Duke Energy, which has 14 former power plant sites in North Carolina, was ordered by the state in April 2018 to pay a \$156,000 penalty for polluting ground and surface waters with coal ash waste around three power plants. This penalty was equivalent to a few days of CEO Lynn Good’s salary, who made \$21.4 million in total compensation in 2017.

In 2015, Duke pleaded guilty to nine violations of the federal Clean Water Act and was fined \$102 million for illegal discharges from coal ash dumps at five North Carolina power plants. This April, North Carolina’s Department of Environmental Quality ordered Duke Energy to completely excavate and close all of its coal ash ponds in the state. Duke has announced it intends to pass the costs to its customers.

State governments are in thrall to the economic power of massive utilities. Appalachian Voices, an environmental nonprofit organization, examined how much North Carolina legislators and candidates received from the nation’s and state’s largest monopoly utility, Duke Energy, in 2018. In total, Duke and the company’s top executives gave \$465,450 to the state’s House and Senate last year. Senate President Pro Tempore Phil Berger (R-30) received the highest amount, \$76,250. House Speaker Tim Moore (R-111) received \$16,550, the highest in the House. About 78 percent of Duke’s contributions went to Republicans, who control both chambers.



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