

10. Environmental Health

Ranked AL's Tenth Health Indicator

Environmental health is a new addition to the SHA and is currently ranked as tenth AL's health indicator. Environmental health is focused on the natural and man-made environments for the benefit of human health. The environment directly affects the quality of life and is impacted by socioeconomic disparities.¹

Environmental health can start within an individual's home with proper ventilation, using non-lead-based paint, properly treated tap water for consumption, and removing electrical hazards.² Maintaining healthy homes and communities helps keep an individual healthy.

Vulnerable Populations

Anyone can be exposed to environmental health concerns, but certain populations are more vulnerable. For example, individuals with cardiovascular or respiratory conditions may be more susceptible to heat-related illness,³ and lead exposure in children can cause underperformance in school and slowed growth and development.

Geographic Variation

Data by geographic region has not been reported for this indicator.

Topics Addressed for This Indicator are:

- Drought and hot weather hazards.
- Public water systems.
- Water quality lead testing at schools.

Highlights

Indicator data are retrieved from the ADPH Bureau of Environmental Services, Environmental Protection Agency (EPA), ALDOT, ALSDE, and local community officials.

- In 2019, there were 510 community water systems throughout AL.
- Lead in water detection tests were conducted at most schools throughout AL in 2017-2019.

Risk Factors:

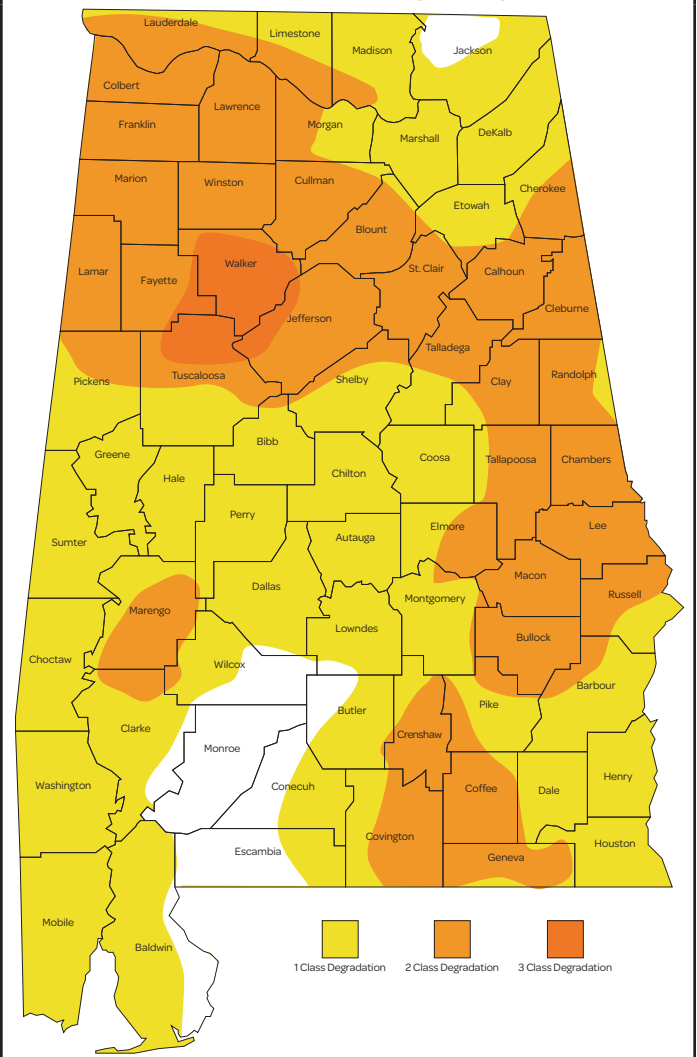
- Low income housing.
- Exposure to chemicals.
- Poor indoor ventilation.
- Drinking unsafe water.
- Unsafe cooking sanitation.
- Climate change.

Droughts and Hot Weather Hazards

AL has a humid subtropical climate, and the seasonal highs have been steadily increasing over time. A heatwave is a period of excessively hot weather that typically lasts two or more days and may be accompanied by high humidity.⁴ In the 1980s, there was an average of four recorded days with heat waves per year. By the 2010s, there were at least 20-30 recorded days a year.⁴ Heat waves are also associated with increased hospital admissions for cardiovascular, kidney, and respiratory disorders.⁵

Heat-related illnesses occur when the body is unable to control its temperature. Heat exhaustion can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids. Vulnerable populations for heat-related illnesses include individuals with chronic medical conditions, infants, older adults, and outdoor workers.⁵

Figure 10.1 – A map of the highest impacted areas of drought between April 2016, to April 2017. Most of the state was at least in one class degradation away from stable water tables. Source: National Drought Mitigation Center.



- Between 2010-2019, there were 379 days of reported heat waves in AL.
- There were 86 physical injuries and 10 deaths due to heat illness in the same period.⁵
- High temperatures can also lead to water shortages. AL has had two statewide severe drought seasons since 2012. This impacts agriculture, fishing, and river wildlife maintenance.
- Figure 10.1 is a map showing how widespread the impact of the 2016 severe droughts was in AL. There were no reported deaths or injuries related to this event.

Summer is the driest time of the year, which can lead to fire hazards. In the past 10 years, there have been nine wildfires, with no injuries or deaths.⁶

Public Water Systems

The Safe Drinking Water Act (SDWA) ensures Americans' drinking water quality by regulating public water systems (PWS).⁷ Under SDWA, EPA sets standards for drinking water quality and oversees the programs for states, federally recognized tribes, and territories that implement the drinking water program. A key component of water quality is fluoridation.

CDC recognized community water fluoridation as one of the ten greatest public health achievements of the 20th Century.⁷ CDC recommends water fluoridation as one of the most practical, cost-effective, equitable, and safe measures a community can take to prevent tooth decay and improve oral health as well.

In 2019, CDC rewarded 56 AL PWS for their consistent and professional adjustment of fluoride content to the recommended level for oral health:⁸

- In 2019, there were 510 community water systems, 22 non-transient, non-community water systems, and 48 transient, non-community water systems in AL.
- Since 2014, AL has conducted at least 542 site visits per year. Less than 22 percent of those PWS had any violations, and no more than 7 sites had a serious violation.
- In Figures 10.2a and 10.2b, there were unusually high amount of violations in 2019 compared to the previous years, but this may have been associated with changes in environmental regulation.

Figure 10.2a – The public water systems by calendar year that had any environmental violations. Source: U.S. EPA.

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|------|-----|
| 2014 | 118 |
| 2015 | 86 |
| 2016 | 60 |
| 2017 | 74 |
| 2018 | 75 |
| 2019 | 117 |

Figure 10.2b – The public water systems by calendar year that had any serious environmental violations. Source: U.S. EPA.

| | |
|------|---|
| 2014 | 4 |
| 2015 | 4 |
| 2016 | 3 |
| 2017 | 2 |
| 2018 | 3 |
| 2019 | 7 |

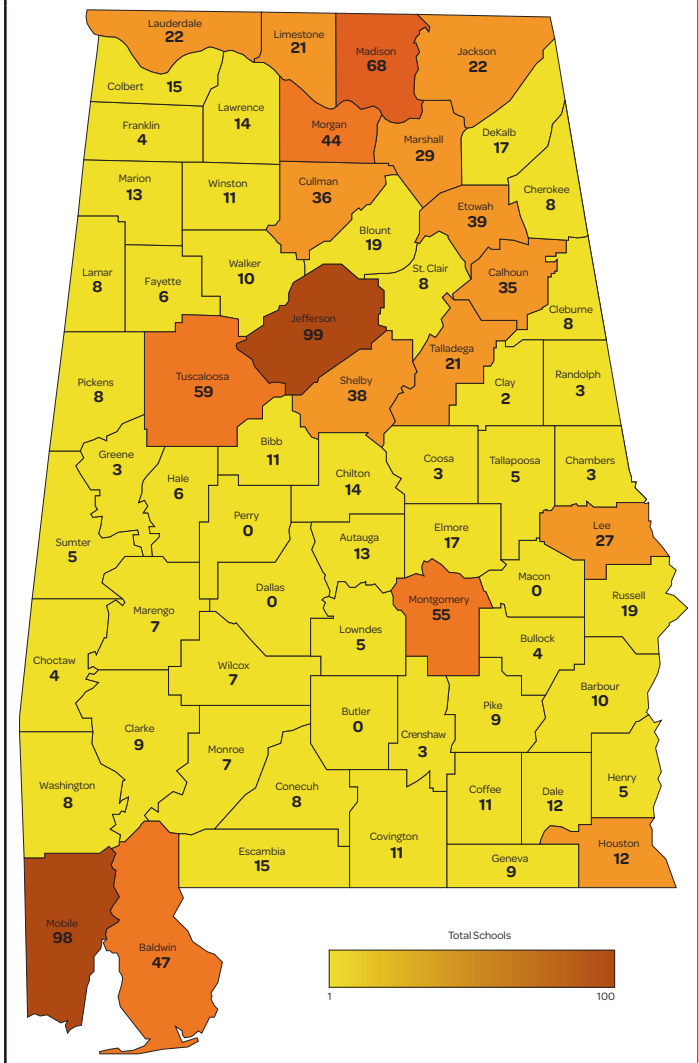
Water Quality Lead Testing at Schools

Lead is a highly toxic metal that was commonly used in household paint (banned in 1978), gasoline (banned for on-road vehicles in 1995), and plumbing pipes and fixtures.⁹

According to CDC, lead is a multi-system toxicant and can cause learning difficulties, digestive problems, kidney damage, anemia, and high blood pressure. Since the body and nervous system are not fully developed in children under 6 years old, high lead exposure can potentially be life-threatening.⁹

Lead levels from blood tests are reportable to ADPH, and it is recommended to test children at 12 to 24 months of age. There is currently no AL regulatory requirement for testing lead levels in the drinking water at schools.¹⁰ However, because school-aged children are especially vulnerable to the adverse health effects of elevated lead levels, the AL Department of Environmental Management (ADEM) and ALSDE joined together in March of 2016, to develop a voluntary school testing program. Testing was held between April 2017 to November 2019.

Figure 10.3 – A map of the school water lead testing across AL. No data reported for Butler, Dallas, Perry, and Macon counties. Source: ADEM.



Site selection was based on plumbing fixture type, age, and accessibility to students and staff, with at least one water cooler and one kitchen sink, tested at each school. More information about this process is detailed on the ADEM website:

- In Figure 10.3, the map indicates over 1,100 public schools have been tested.
- Detectable lead levels were in 33 schools in AL, which required affected plumbing fixtures to be taken out of service, replaced, and resampled.

Data Sources

Figure 10.1 – U.S. Drought Monitor Class Change – AL, 1 year. USDA National Drought Mitigation Center, 2016-2018. Data requested July 2020.

Figure 10.2a – PWS with At Least One Violation. U.S. EPA, Enforcement and Compliance History Online, 2019. Data requested July 2020.

Figure 10.2b – PWS with Serious Violations. U.S. EPA, Enforcement and Compliance History Online, 2019. Data requested July 2020.

Figure 10.3 – Schools Participating in the Lead Program, 2017-2019. ADEM, 2019. Data requested March 2021.

Written Sources

1. Healthy People 2030, Environmental Health, 2020.
2. ADPH Bureau of Environmental Services, Indoor Air Quality and Lead, 2019.
3. CDC, Warning Signs and Symptoms of Heat-Related Illness, 2020.
4. U.S. EPA, Health Effects of Residence near hazardous Waste, 2000.
5. CDC WONDER, Environment: Heat Wave Days May - September 2018.
6. National Oceanic and Atmospheric Administration, AL Weather Events, 2020.
7. CDC, Community Water Fluoridation, 2020.
8. U.S. EPA, Drinking Water Dashboard, 2019.
9. CDC, Lead Levels in Children, 2020.
10. ADEM, Lead Testing in Schools Final Update, 2019.

Community Resources

ADPH Indoor Air Quality Lead Branch

Location: Montgomery County, AL
Type: State Government Organization

ADEM

Location: Montgomery County, AL
Type: State Government Organization

AL Rivers Alliance

Location: Jefferson County, AL
Type: Non-profit Organization

Black Warrior River Keeper

Location: Jefferson County, AL
Type: Non-profit Organization

Cahaba River Society

Location: Jefferson County, AL
Type: Non-profit Organization

Children's Environmental Health Network

Location: Washington, DC Metro
Type: Non-profit Organization

Conservation AL

Location: Montgomery County, AL
Type: Conservation Area

Emergency Management Agency

Location: Chilton County, AL
Type: State Government Organization

Land Trust of North AL

Location: Madison County, AL
Type: Conservation Area

Red Mountain Search Dog Association

Location: Shelby County, AL
Type: Nonprofit Organization