The Writing Center Review

The Problem with Subsidence in Ohio
By Katherine C. Sherry
Make a pamphlet on an environmental issue affecting Ohio. This assignment was completed for Dr. Carrie Schweitzer's How the Earth Works.

(Pamphlet appears on the following pages.)
**When and Where it Happens?**

Mine Subsidence can happen at any time (Crowell). The biggest problem areas in Ohio are in Stark county, Jackson county, and Tuscarawas county (Crowell). Though these are the most problematic areas, homeowners in 26 of the 37 counties have the required mine subsidence coverage in their insurance policies (Ohio.gov).

**Ohio Counties That Have Mine Subsidence Insurance**

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Ohio Counties Affected by Mine Subsidence Insurance Coverage
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![Ohio Counties Affected by Mine Subsidence Insurance Coverage](image)


It is assessed that there are over 8,000 coal mines in Ohio alone (Crowell). There are two kinds of subsidence: pit and sag subsidence (Crowell). Pit subsidence is recognized by a steep, circular hole where the water drains to the center of the hole (Crowell). The sinking occurs suddenly and quickly (Crowell). Sag subsidence happens gradually, and might flood if it converges with a water table (Crowell).

Unfortunately, evidence proves that subsidence is increasing (Crowell). This is because of the old age of the underground mines (Crowell).

**What is Being Done**

Fortunately the government of Ohio is aware of the issue and is making means to prevent more subsidence events. In 1985 they put the Ohio Mine Subsidence Insurance Law into effect which decrees that mine subsidence coverage is given in basic homeowner insurance policies, especially in the problematic regions (Ohio.gov). The Ohio Department of Natural Resources is trying to fully map out where the abandoned underground mines are (Ohio.gov). They will have the knowledge of where potential problem areas will be.

**Full Bibliography**


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**What is Coal Mine Subsidence?**

Coal Mine Subsidence is when the Earth's surface drops because the ground underneath is filling the holes that were initially caused by mining (Ohio.gov). Subsidence can happen naturally, but coal mine subsidence is caused by humankind ("Subsidence"). This sudden collapse at the earth's surface can lead to devastating effects; it damages homes and buildings, roads, underground facilities, and can be very dangerous for humans (Ohio.gov).

**Mine Subsidence**


How the Earth Works TR 9:15-10:45am

Unfortunately mine subsidence is a big problem in Ohio, specifically in Stark County, Jackson County, and Tuscarawas County (Crowell).
The Cost of Subsidence

The mine subsidence can lead to very dangerous problems, especially if it occurs on roads. A team from the Ohio Department of Transportation (ODOT) looked into the subsidence underneath Interstate 70 in 1995 (Hoffman 418).

They discovered that before construction, all of the surface runoff flowed into Mud Run (Hoffman 418). After, most of the runoff flowed into the channel next to the highway (Hoffman 418). The slope of that area is very gradual, changing the land into marshes (Hoffman 418). With further investigation, the ODOT detected the highway to be unstable and proceeded to close the lanes (Hoffman 421). The total cost to fix everything was $3,600,000 (Hoffman 421).

Ohio subsidence has caused $7.9 million in damage according to the US Office of Surface Mining (“Mine Subsidence Insurance”). The ODNR Division of Mineral Resources Management estimates the cost to be even more, around $23 million (Crowell).

For homeowners, claims regarding subsidence can reach high numbers. In 1998 claim payments reached $134,000 (“Mine Subsidence Insurance”).

The cost of subsidence is expensive, but along with large amounts of money it comes with health costs as well.

Economic and Environmental Impact of Subsidence

There are environmental issues that arise from subsidence are caused by water. When the ground surface is broken, water is able to go into the underground mine from the broken surface (Chambers). Water from above, like precipitation or surface runoff, now flows into the open mine (Chambers).

The water in the mine leads to decomposition of the minerals in the mine (Chambers). Multiple metals are hazardous to aquatic life (Chambers). They are toxic and will dissolve sulfide minerals, such as mercury, which will contaminate the water (Chambers). The contaminated water will transport the toxins away from the mine which may lead to long term problems (Chambers). The water is now polluted and is unsafe for drinking and wildlife.

The people who live where there is land degradation caused by mining will experience poor air quality, noises and vibrations, as well as water pollution (Maiti). The water pollution will lead to vegetation loss (Maiti).

Mine subsidence affects the direction of water runoff and drainage (Hoffman 421). This can lead to drastic changes in the environment.

Mine subsidence can cause fractures in the ground (Pigati and Lopez 51). The fractures contain groundwater (Pigati and Lopez). Water drains into the sinkholes and will build up in the mine, eventually leading to a flood at the surface (Pigati and Lopez 51). These sudden floods alter the ecosystems of the environments.

Health Impacts

Since subsidence sinking is so sudden and unexpected, it can cause injuries to people. They are typically rare events, but they are more likely to happen if cities are built on loose sediments like clay, sand, or silt (Zeitoun and Wakshal 1).

Subsidence sinking rarely hurts anyone, however if it occurs on a roadway the chances of getting hurt increase (Ohio.gov). If it occurs while cars are driving over that road, the cars might crash into each other or fall into the ground depression.

A big health hazard that arises from subsidence sinking is polluted water (Chambers). The polluted water affects all wildlife, including vegetation, animals, and humans if that is their drinking supply (Maiti).

The filled entrances of mines can be dangerous as well. When closing the entrance to a mine, mine debris was poured into the opening without thought to the stability of the debris (“Subsidence Information for...”). The unconsolidated debris may fall deeper into the mine, which will lead to the shaft opening again (“Subsidence Information for...”). The shallow pockets might sink due to small vibrations such as feet walking along the top (“Subsidence Information for...”).

When these abrupt collapses occur, they are quite harmful and cause serious injuries (“Subsidence Information for...”).