



Hazards

62. Can my house ever be flooded?

FEMA's flood insurance rate maps show areas that may be flooded periodically. The Oklahoma Water Resources Board also has information about flooding, and you can consult your local floodplain administrator.

Many of Oklahoma's streams and rivers are subject to flooding, and, as development continues, the pressure to build in areas of potential danger will increase. The OGS has the series "Flood Insurance Rate Maps" by the Federal Emergency Management Agency for the entire State. (FEMA's Map Service Center [Appendix 2] also sells the maps at a nominal cost.) These maps show areas of "100-year" and "500-year" flooding, and areas of minimal flooding. However, a special note at the bottom of the maps states that they are "for flood insurance purposes only" and do "not necessarily show all areas subject to flooding."

An excellent source of information on flooding is the Oklahoma Water Resources Board (Appendix 1). You may call them or access their website. Also, most parts of the State have floodplain administrators who have detailed knowledge of local areas. The floodplain administrator may be a city planner, a water or sewer supervisor, or other city official.

63. Will my house's foundation ever crack?

Foundation cracking depends on many factors, including soil composition, drainage, and construction methods used. Clays that have a high shrink-swell potential are common in some geologic formations in Oklahoma, and maps and reports that document this are available.

The primary cause of foundation cracking is seasonal shrinking of soils that are rich in certain clay minerals. These soils, which commonly develop on shale, typically expand when wet and shrink as they dry. During periods of severe drought, the soil may shrink to such an extent that it "pulls away" from your house's foundation, leaving it unsupported and subject to cracking.

Several nongeological factors also can contribute to foundation cracking over time, including poor site drainage, improperly compacted fill, plumbing leaks, poor construction, and the wrong kinds of plants next to the house.

The kind and amount of clay in a soil is important for determining whether the soil near your house is likely to shrink and swell. A clay mineral that is especially susceptible to shrinking and swelling is montmorillonite; clays that are less so are illite, kaolinite, and chlorite. Some clays are "mixed-layer clays" and consist of two or more different clay minerals. In southeastern Oklahoma, the Eagle Ford and Bokchito Formations (both Cretaceous) contain shale layers rich in montmorillonite. Elsewhere in the State other formations contain shale with minor montmorillonite, generally as mixed-layer clays.

Detailed, large-scale geologic maps typically show the distribution of shale-rich formations, and some reports describe the clay mineralogy of those formations. For example, the Fairmont Shale (a part of the Permian-aged Hennessey Formation), which is widely exposed near Oklahoma City, has "a low to medium shrink-swell potential" (Johnson and others, 1980, p. 18).

Geologically, it is safer to build a home on soils derived from sandstone or limestone than shale. Most Oklahoma shales contain little montmorillonite, but in times of severe drought, even a small amount of montmorillonite can cause foundation problems.