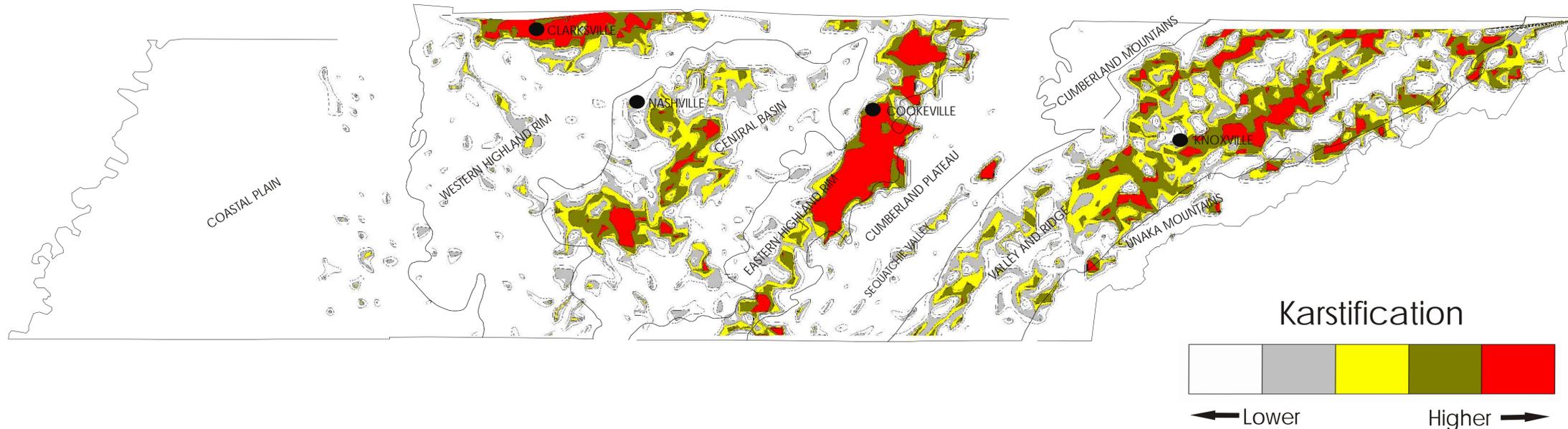
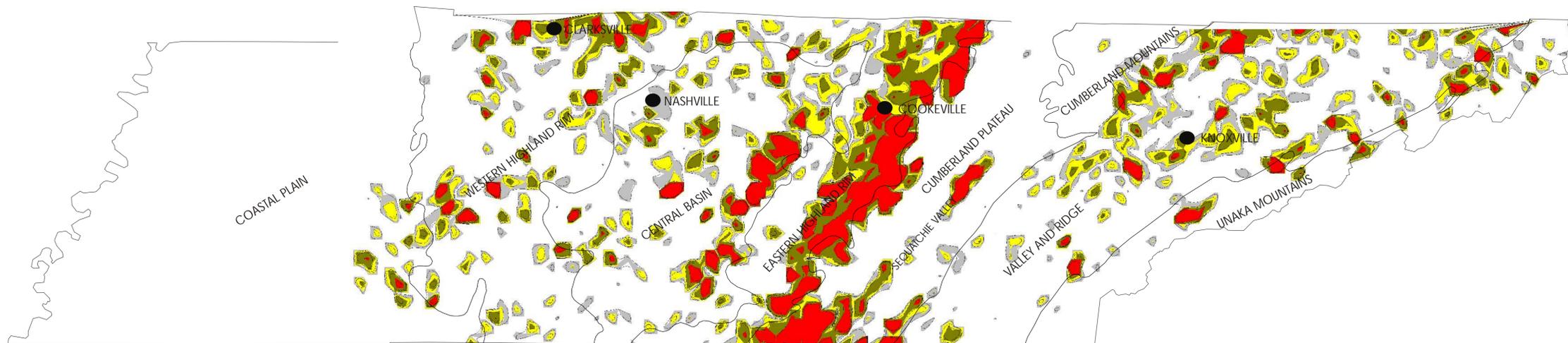


Geographic Distribution of Sinkholes and Caves in Tennessee

Sinkhole development



Cave development



Karst is a general term used to describe regions where landforms most often result, either directly or indirectly, from dissolution of limestone bedrock. Sinkholes and caves are characteristic karst features. Areas with karst development are said to be karstified. Much of Tennessee is underlain by limestone, so it is no surprise that Tennessee is one of the most heavily karstified regions in North America. As a matter of fact, the area surrounding Putnam county has a very high density of caves per unit area, with over 2700 known caves. This same region exhibits the highest concentration of sinkholes per unit area in Tennessee.

The maps presented here show the extent of karstification in Tennessee. These are contour maps, where regions of higher karstification are surrounded by regions of successively lower karstification. While the map legend only indicates a simple low to high scale, the maps are based on more quantitative data. The sinkhole map is based on data obtained by statistically sampling topographic maps, and indicates the areal extent of sinkhole development; i.e. the area of sinkholes per unit map area. The cave map is based on the sum of cave passage lengths per unit map area.

Tennessee is divided into regions termed physiographic provinces, where each province exhibits a distinct topographic style or other physical characteristic. The names of these provinces are indicated on the maps. Note that karstification is concentrated in certain portions of certain physiographic provinces. To the northwest, around Clarksville, sinkhole and cave development are fairly extensive. Even more extensive karst is developed on the Eastern Highland Rim. Karst is also developed in the Valley and Ridge in east Tennessee (note how the distribution of the karst follows a southwest-northeast trend). The distribution of karst in the Central Basin is somewhat different. To the east and southwest of Nashville, sinkhole development is fairly high, but there is little cave development. Conversely, to the west of and along the Eastern Highland Rim escarpment, cave development is fairly high, with little sinkhole development. In most cases, the boundaries where karstification drops to zero or near-zero are directly related to the contact between different rock units.

A couple of simple conclusions can be drawn. (1) Since the boundary between regions of high karstification and little to no karstification are directly related to bedrock contacts, it seems that certain limestone units promote the development of karst more than others do (bear in mind, though, there are other contributing factors). (2) While sinkholes and caves both develop in limestone bedrock, they do not both necessarily develop in the same locations.