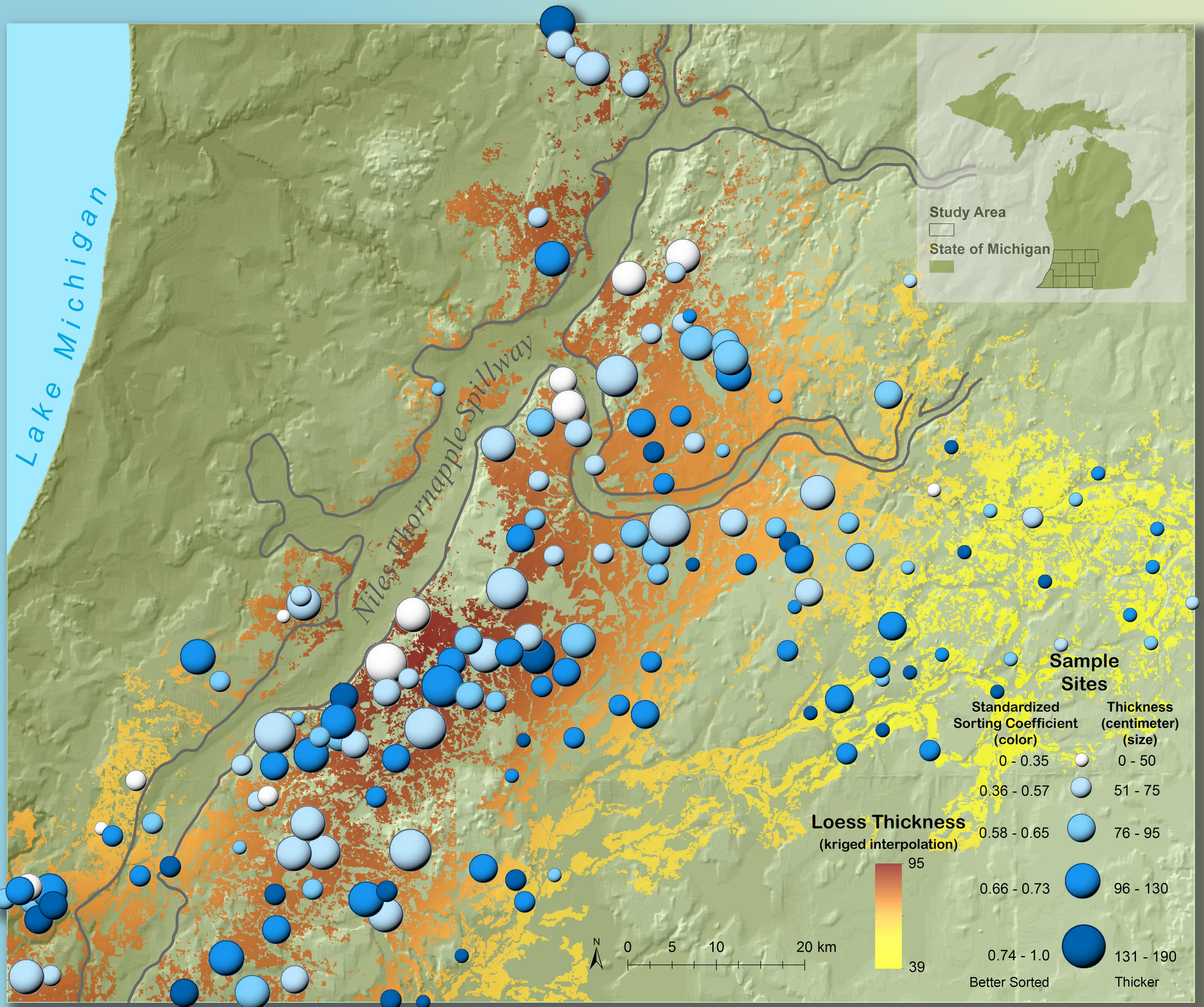
Loess Distribution and Character in Southwestern Michigan



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Software: ArcGIS 10.2 for Desktop, Adobe Photoshop 2015

Data Source: NRCS Soil Survey (SSURGO), Michigan Geographic Data Library (MiGDL)

Abstract:
Soils on many of the outwash plains in southwestern Michigan have loamy textures, despite being underlain by sand-textured outwash. The origin(s) of this upper, loamy material has long been unknown. We analyzed the spatio-textural characteristics of these loamy-textured sediments, in order to ascertain their origin(s). The textural curves of this material are bimodal, with clear silt and sand peaks. Because the sand peaks align with those in the outwash below, we conclude that the upper material is a mixture of an initially silty material with the underlying sand, forming loamy textures. Knowing this we determined that nearly all of the soils originally had silt loam upper profiles, typical for loess, i.e., wind-blown silt. Field data, shown here, confirmed that the loamy material is thickest east of a broad, N-S trending valley (the Niles-Thornapple Spillway) that once carried glacial meltwater. The map also shows that the loamy material becomes better sorted away from this channel. We conclude that the loamy mantle on many of these outwash plains is silt-rich loess, derived from the Niles-Thornapple Spillway and its tributary channels, and transported on mainly westerly winds. The Spillway was active between ca. 17.3 and 16.8 k cal. yrs ago, when a large network of tunnel channels existed beneath the stagnant glacier, helping to funnel silt-rich sediment into the Spillway.