The North Star Middle School is located in Eau Claire, WI, along a west-facing, wooded, bedrock ridge behind the school, and other green spaces like it are threatened by development, but may be unsuitable for it and better left as natural green spaces. We examined soil morphology to inform best land use for the study area. Three soil pits were excavated collocatedly with UWEC geography within the study area. Soil profiles were described in the field to determine horizon: color, texture (confirmed in the lab using a Gilson sonic sifter), structure, and boundary depths and architecture. Profiles were then photographed and sampled. The soil profiles we observed exhibit sandy texture and weak horizonation (A-Bw-C) typical of soils formed from sandy bedrock on 6-12% slopes and are consistent with previous soils work in the study area (and with Boone-Plainbo Complex soils as described by the NRCS). These sandy soils are fragile and when disturbed are prone to wind and water erosion. They are unsuited to high traffic activities and are difficult to develop without causing erosion. We recommend the study area remain an area used for light recreation (e.g., Frisbee golf), as an outdoor classroom, and as wildlife habitat.

North Star Middle School site location is shown in Figure 1. Color is determined by the Munsell Book (Figure 2). The Munsell Book is a scientific way to interpret the specific color of a soil horizon. The book uses hue, chroma, and value to determine color of the soil. Hue is the color we see; chroma displays the amount of lightness or darkness in a soil. Value represents the amount of hue we see. Texture is determined by using a clear card, used to determine the grain shape and size, and the texture (Figure 3). Structure and consistence is specified by performing the ribbon test. We also took soil samples of each horizon for laboratory measurements. We also took photographs of each horizon for reference later in our research.

Our field research began with the excavation of three pits to a depth of 1.5 m. After, the excavation of the pits we examined the entire soil profile and each horizon was described based on the following information: color, texture, grain size, madness of grains, structure, and consistence from a chart shown in Figure 1. Color is determined by the Munsell Book (Figure 2). The Munsell Book is a scientific way to interpret the specific color of a soil horizon. The book uses hue, chroma, and value to determine color of the soil. Hue is the color we see; chroma displays the amount of lightness or darkness in a soil. Value represents the amount of hue we see. Textures are determined by using a clear card, used to determine the grain shape and size, and the texture (Figure 3). Structure and consistence is specified by performing the ribbon test. We also took soil samples of each horizon for laboratory measurements. We also took photographs of each horizon for reference later in our research.

We took a small sample of soil from each horizon. To begin with, we took out 50.0 grams of each horizon sample. We then put in an evaporator at 100°C to remove all of the moisture from the soil samples. Next we weighed the dry mass sample of each horizon. Then we put each sample through a stack sifter as shown in Figure 4, each sifter was a different size, in microns. We then weighed each micron size in grams. Finally we make a table of each mass in grams of micron particle size. The table helped us determine what the soil is composed of.

Soil Texture Flow Chart

Figure 2 Munsell Book

Figure 3 Sand Chart

Figure 4 Soil Flow Chart

References