**PhD Dissertation**
**Department of Environmental Science and Policy**
**College of Science**
**George Mason University**

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**Title**: Characterization and analysis of forested wetland soil color variables, redoximorphic features, and biogeochemistry in the region of northern Virginia, USA – Implications for wetland ecology and management

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## ABSTRACT

While many wetland ecosystem services are the result of complex biogeochemical processes facilitated by microbes within the soil matrix, soil biogeochemistry can often be signaled through soil properties, some of which—like color—can be accessibly observed or unearthed by scientists and the general public alike. The proposed dissertation aims to connect measurements of soil color variables in 4 forested wetlands of northern Virginia, USA, to commonly-used indicators of wetland development, including hydrologic and physical soil attributes like bulk density and climate-related measures of soil carbon storage potential. Using both the conventional method of soil color determination—the Munsell Soil Color Chart (MSCC)—as well as a novel Bluetooth-linked device that automatically records color for the user—the Nix Color Sensor (Nix)—this dissertation highlights the potential for color measurements to aid local land/watershed planning through identifying current and future potential wetland areas, estimating soil carbon storage in green spaces, and encouraging greater community connection to soils through environmental literacy endeavors.