

**AN ANALYSIS OF PALUSTRINE MITIGATION WETLANDS IN THE
VIRGINIA COASTAL PLAIN**

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(ABSTRACT)

In recent years, the success of wetland mitigation projects and their ability to function as natural systems has been questioned. This study was conducted (i) to characterize and examine differences between mitigation and natural wetlands, (ii) to examine differences in soil morphology along a wetness gradient in mitigation and natural wetlands, and (iii) to observe changes in mitigation wetlands with time. Site characteristics, including soil properties, hydrology, and vegetation, were analyzed for three mitigation-reference wetland pairs located in the Virginia Coastal Plain. Hydrologic regimes of mitigation areas, when compared to reference areas, generally showed larger differentials between seasonal high and low watertables. Mitigation areas, dominated by herbaceous vegetation, tended to be lower in C and N levels and higher in soil pH, and much higher in bulk density than the mature forested reference wetland. Initially low levels of C and N did not increase significantly over the five-year study period. Soils in the mitigation area were more uniform and considerably less differentiated when compared to those of the reference area. Testing for Fe(II) with α, α' -dipyridyl dye solution produced mixed results, obtaining both positive and negative reactions to saturated samples. Oxidized rhizospheres, associated with active root channels in surface horizons, formed in less than ten years under the current hydrologic conditions. These features were more abundant and more prominent in areas saturated at or above the surface for longer periods of time. Overall, site differences between mitigation and reference areas are mainly due to construction practices and a lack of organic matter accumulation. Better design methods should incorporate the addition of organic amendments, with attempts to minimize soil compaction.