

Approaches to Mapping Nitrogen Removal: examples at a landscape scale  
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Wetlands can provide the ecosystem service of improved water quality via nitrogen removal, providing clean drinking water and reducing the eutrophication of aquatic resources. Within the ESRP, mapping nitrogen removal by wetlands is a service that incorporates the goals of the nitrogen group, wetland group, and is being conducted in various place-based programs. Three approaches to nitrogen removal are currently being considered and tested. There are many other valid approaches that will not be considered here. Approach 1) Use existing denitrification values for wetland types and apply them to current and future wetlands acreage. This approach has been done in estuarine, brackish, and freshwater tidal wetlands of Georgia to determine the influence of sea level rise on potential denitrification. Sea level rise effects on wetland types are currently beginning in the Coastal Carolinas and the approach above can be applied to the modeled areas. Approach 2) Potential nitrogen removal via riparian wetlands can be estimated using a GIS analysis developed to identify the connectivity of agricultural land with riparian buffers via flow-paths. The GIS tool was developed in watersheds of the Chesapeake Bay and is currently being tested in the Willamette valley and watersheds in North and South Carolina. Input data resolution testing has been conducted and outputs from the GIS tool have been included in an over-simplified model to estimated potential nutrient removal. 3) Potential nitrogen removal of sited wetlands (Iowa CREP-style) at a large scale has also been done for the Upper Mississippi river and Ohio River basins. The method will now be applied to wetlands of North and South Carolina. Currently, nitrogen data is being compiled in order to determine flow-weighted average nitrate concentrations. Modeling of nitrogen removal will attempt to incorporate climatic variability and wetland performance variability. Challenges and limitations of each approach will also be discussed.