

Public Abstract

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Title:MODELING WETLAND CONNECTIVITY AND VULNERABILITY TO WETLAND-CORRIDOR LOSS

Wetland systems involve a complex range of important biological, chemical, and hydrologic interactions among individual wetlands which contribute to ecological health. Modification of the landscape due to anthropogenic development has a direct impact on the connectivity supporting these interactions as well as the ecology of a region. It is thus important for individuals and agencies involved in the management and protection of wetland systems to understand the baseline condition of wetlands, supported interactions, and how potential land use and infrastructure modifications may change the strength of underlying connectivity. This baseline connectivity should, therefore, be rigorously defined, accommodating considerations of different types of connectivity and measurement systems. To better understand these issues, a framework is proposed for representing and reasoning about the connectivity of aquatic resources. In particular, a corridor-based representation of connectivity and network-based optimization methods have been developed and implemented in a geographic information system to establish a baseline level of connectivity and to model the effect of potential landscape changes. The developed framework is applied to a wetland system in Missouri to demonstrate the tradeoff between proposed mitigation options and ease of ensuring sustained system connectivity. More broadly, this type of connectivity analysis can be used to inform many types of planning decisions such as those considering alternative courses of development, prioritization of wetland management/protection resources as well as those addressing policy or regulatory matters.