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Assessing no net loss of ecosystem services: Are perceived conflicts with functions an artifact of our assessment paradigm?

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Abstract

Since the implementation of the U.S. policy of No-Net-Loss (NNL) of Wetlands, we have made fundamental scientific advances that tighten the linkage between wetland structure and the functions they support. Through these, we have produced effective tools to assist in achieving the goal of No-Net-Loss of wetland function. However, we still lack the tools to determine if the policy's additional goal of No-Net-Loss of wetland values is being achieved. To develop such tools, we need to advance the linkages between wetland structure and functions, and ecological services that benefit human well-being. Using established literature, our team is developing a conceptual model that defines these linkages and relates them to key management objectives of both wetland and water quality programs. Then, our team explores potential conflicts that may arise when attempting to blend permitting goals to the achieve NNL with management to enhance ecosystem service. To illustrate the linkages, potential conflicts, and potential solutions our team uses a suite of case studies that represent a gradient of wetlands from systems created specifically to provide a single ecological service (e.g. sewage treatment or stormwater storage), to green infrastructure systems designed to attenuate the impacts of urbanization, to fully functioning systems intended to meet mitigation requirements. The lessons learned from this effort can be used to further develop ecosystem service assessment tools that directly link to commonly used metrics of wetland function.