Abstract Title:
Mapping Flood Protection Benefits from Restored Wetlands at the Urban-Suburban Interface

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Abstract:
Urbanization exacerbates flooding by increasing runoff and decreasing surface water storage. Restoring wetlands can enhance flood protection while providing a suite of co-benefits such as temperature regulation and access to open space. Spatial modeling of the delivery of flood protection from wetlands can inform decision making regarding the placement of restoration projects by identifying sites with the potential to provide flood protection to multiple beneficiaries. However accurate modeling can be difficult in an urban watershed due to piping and other land alterations. Given these limitations, we conducted an analysis of flood protection delivery that can be performed on a state or regional extent. In the Woonasquatucket River watershed, an urbanizing watershed with its terminus in Providence, RI, we build upon an existing functional assessment of riparian wetlands to develop a complementary assessment of the provisioning and delivery of a suite of ecosystem benefits. To estimate the extent of the market for the benefit of flood protection, we trace its delivery in the watershed by linking upstream wetlands with the downstream flood-prone areas through flow path analysis. This spatial modeling of flood protection delivery can explicitly link communities to wetlands that provide benefits and can be used to identify restoration sites that serve areas in need of flood protection.

Keywords:

flooding, ecosystem services, mapping, urbanization