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Progress on integrating and communicating uncertainties in robust spatial targeting for provision of multiple ecosystem services

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Abstract: Spatial prioritization, or spatial targeting, involves determining where to conduct or incentivize different activities on a landscape, in order to achieve a desired combination of benefits (often formalized within an ecosystem services framework). It has a long history in conservation targeting for protected areas, but assessment of landscape portfolios is significantly more complicated when multiple actions can be considered, to achieve many objectives. And while it is somewhat straightforward to construct a formal optimization problem, there is often a significant gap between formal problem specification and results that are useful in a particular policy or decision making context, especially in light of parametric, structural, and scenario uncertainties. This talk will discuss recent advances, experiences, and tools used to address these practical complications. We present a preliminary R package (“uncertitude”) that can be used in concert with multiple spatial prioritization tools such as *prioritizr* in R and *ROOT* in python. Drawing from a variety of geographic contexts in the US and around the world, we discuss dynamic and static decision-aiding visualizations and the computational workflows necessary to create them, including explorations of uncertainties.

Keywords: ecosystem services, multi-objective; multi-criteria; optimization; spatial analysis