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Investigating the spatial characteristics of GIS visibility analyses and their correlation to visual impact perception with stochastic tools

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In the effort to manage and mitigate landscape impact from works of infrastructure, various methods have been developed to quantify and evaluate visual impact, ranging from photo-montage and digital representation to Geographic Information Systems (GIS) viewshed analyses. These methods can be divided into two broad categories; quantitative methods that mainly focus on calculating the extents of the area affected, in each case, and qualitative methods that focus on the perception of the landscape transformation by individuals.

In this study we develop an evaluation methodology for quantitative methods of visibility analysis that generate Zone of Theoretical Visibility (ZTV) maps. In particular, we utilize stochastic tools to correlate spatial patterns of visibility analysis maps to increased qualitative concerns that are connected with opposition to projects of infrastructure. A stochastic computational tool (2D-C) is used of the analysis of images. 2D-C is a tool capable of characterizing the degree of variability in images using stochastic analysis, and thus, the change in variability vs. scale, among images. The methodology investigated incorporates 2D-C in a GIS environment for landscape impact management and proposes a procedure to assess impacts which can aid relevant policy.