

Georgia Nonpoint Source Prioritization

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Abstract. Georgia EPD has developed a process for prioritization of watersheds for restoration and protection efforts. These priorities will guide Georgia’s EPD’s §319(h) competitive grant funds, other EPD efforts including potential compliance assurance efforts, and EPD’s partners’ nonpoint source control activities. In this report, watersheds are filtered and ranked based on a variety of factors, including pollutant of concern: bacteria, sediment, Ecological: stream order, % natural cover; Impacts from pollution loading: development intensity or pollutant loading, and Social Factors: like completion of an approved EPA nine-element compliant watershed management plan, §303(d) listing status, completion of TMDL (Total Maximum Daily Loading), or presence of active watershed groups to implement restoration activities. The ranking system is intended to identify watersheds that are most ready for restoration and protection efforts and to demonstrate effective expenditure of Federal, State, and local funding.

INTRODUCTION

The Georgia Environmental Protection Division (EPD) administers a Nonpoint Source Control Program in Georgia. Section §319 of the Clean Water Act calls for delegated States to develop a state management program for the control of nonpoint source pollution and for periodic updates to the plan. Georgia EPD recently completed its update of Georgia’s Statewide Nonpoint Source Management Plan (2014), which calls for increased use of prioritization metrics for nonpoint source management program and for awarding competitive §319(h) grants for local governments’ and partners’ nonpoint source programs. This paper outlines the development of those metrics, expected uses of the prioritization output, and potential future refinements.

METHODS

Prioritization is a process of focusing activities in a manner that is consistent and efficient in order to maximize the probability of achieving a common goal. Achieving these goals can demonstrate program effectiveness to funders and other stakeholders. Georgia’s Statewide Nonpoint Source Management Plan identified multiple goals of the nonpoint source program, including:

- Pollutant load reductions;
- Remediating streams and other water bodies for at least one constituent that does not meet water quality standards, with the ultimate goal of removing it from the State’s integrated §303(d)/305(b) list of impaired waters; and
- Addressing important nonpoint source issues like lake trophic status and nutrient management.

Georgia has a large number of listed waters, contained within approximately 880 HUC-12 watersheds. In order to appropriately narrow the focus of this work, Georgia EPD elected to prioritize water bodies with the greatest potential for, restoring stream/water body health.

Georgia EPD evaluated a number of metrics to define restorability based on three criteria: 1) Ecological, 2) Pollutant Impact, and 3) Social Readiness for nonpoint source management activities toward restoration. EPD made use of the EPA Recovery Potential Screening Tool (2014), a spreadsheet-based model with numerous preloaded datasets. This tool allows the user to compare multiple factors across HUC-12 watersheds. A restoration potential index score is calculated from weighted composite scores of the Ecological, Pollutant Impacts, and Social readiness scores using the following function:

$$\text{Index} = \text{Ecological} - \text{Impacts} + \text{Social}$$

For Ecological metrics, Georgia EPD selected % Natural Cover, N-index2 in riparian (streamside) zone and

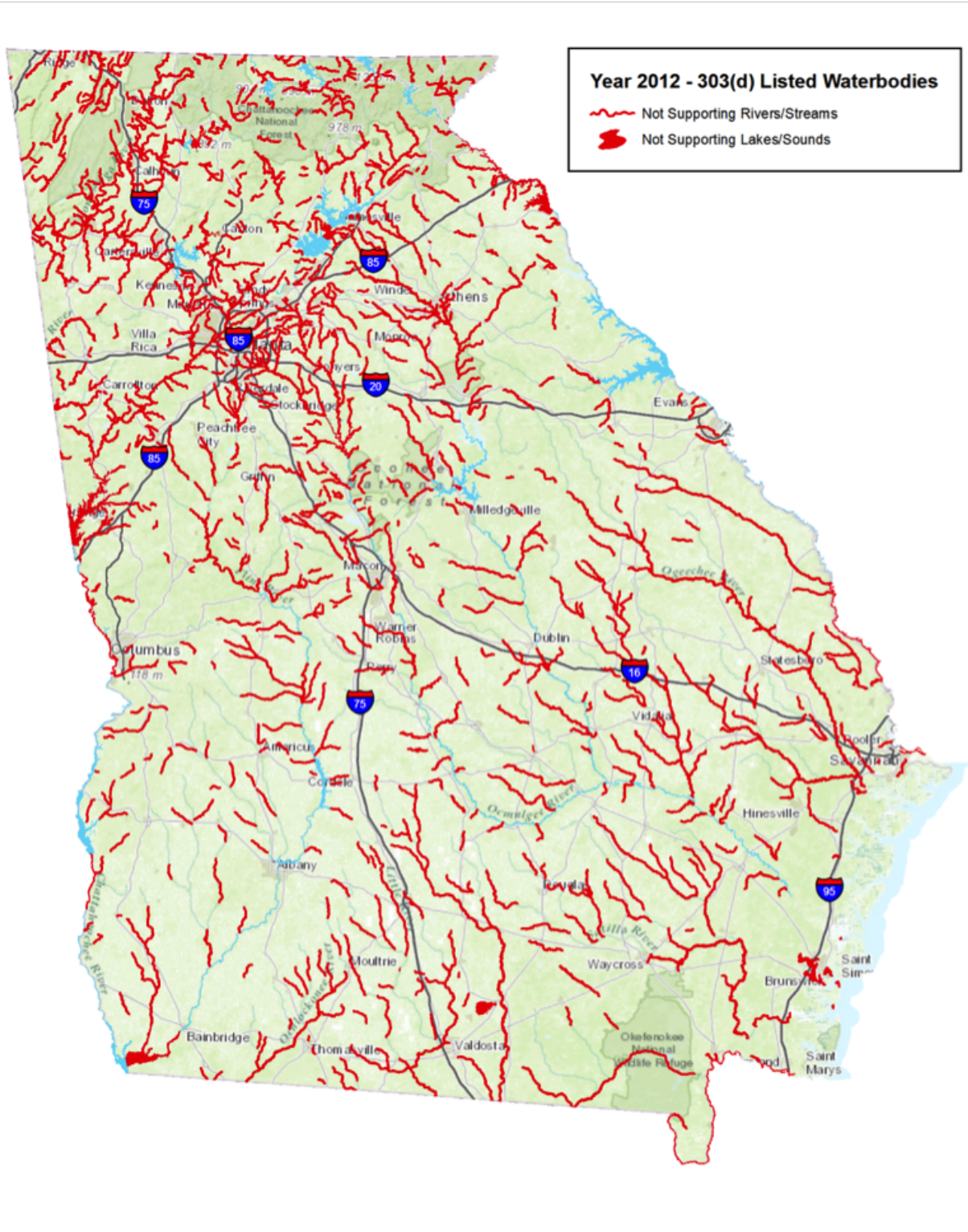


Figure 1: Georgia 2012 §303(d)/305(b) impaired waters not supporting designated uses.

% Natural Cover, N-index2 in watershed. Both of these values were calculated from areas that were not classified as barren, urban or agriculture from the 2006 National Land Cover Dataset version 1. Areas with more “natural” lands would be expected to be more easily restored than more developed areas.

For Pollutant Impact Metrics, Georgia EPD examined % Impervious Land Cover in the Watershed from the 2006 National Land Cover Dataset version 1; # of road crossings in the watershed; and Empower density of the watershed. There is a generally well defined negative relationship between impervious land cover and water body health (Wood et al. 2013; Allen 2004). Road crossings also show a negative relationship to stream health (Alberti et al. 2007; Carlisle 2009). Empower Density, energy use per area per time, is calculated as average values for land use categories. Energy is the calculated energy use transformed to a common value using transformity conversion factors derived from previous studies of how much energy is required for production. Only nonrenewable energy use was considered when determining the human impact from energy use within the watershed. Empower density allows the comparison of intensity of development of different types of development, like agricultural and urban areas. A negative correlation exists between the empower density and watershed conditions (Brown and Vivas 2004).

Finally, EPD derived a social readiness metric based on restoration-focused social factors. The principle factor utilized for this metric concerned the availability of Watershed Management Plans within the watershed. These Plans are a prerequisite for competitive §319(h) grants, so this factor was double weighted in comparison to the other factors considered for this metric. Georgia EPD also counted the number of active Adopt-a-Stream sites and the number of RiversAlive stream cleanups reported to the Georgia EPD Outreach Unit within the watershed during 2013-2014. A larger number was expected to have greater level of social readiness due to heightened public participation in nonpoint source control activities. Additionally, EPD included a measure of potential wetlands of high quality identified in a previous GIS study to locate wetlands with high potential for restoration (Kramer et al. 2008).

RESULTS AND DISCUSSION

The EPA Recovery Potential Screening Tool (2014) was run with the prior discussed indices, focusing exclusively on HUC 12 watersheds containing water bodies listed as impaired for pathogens, sediment (biota), or dissolved oxygen - indicators likely to be influenced by nonpoint

Table 1: Metrics used to analyze the recovery potential of HUC-12 watersheds.

Category	Metric
Ecological	% Natural Cover, N-index2 in riparian zone
	% Natural Cover, N-index2 in watershed
Impacts	% Imperviousness - Watershed
	# of Road Crossings
	Empower density - mean value of watershed
Social	# of Outreach Events
	Watershed Management Plan Available (yes/no)
	Wetlands with high potential for restoration

source pollution and potentially restorable with management practices. Each watershed was ranked based on the calculated recovery potential index. The top 20% of watersheds were selected and a map was produced showing the spatial distribution of the prioritized watersheds throughout the state.

Results indicate a broad geographic distribution with prioritized watersheds in each Water Planning Region and major river basin of the state. As expected, the prioritized watersheds are generally more rural since they often have more natural land cover and less impacts, which makes them more easily restorable.

These results will be used to guide §319(h) competitive grant awards and other nonpoint source management programs. It should be noted that projects in priority watersheds will score higher, but not so high as to preclude nonprioritized watersheds from funding. A good project outside a priority watershed is better than a bad project in a priority watershed.

In the future, Georgia EPD will continue to refine the tool and incorporate additional factors, such as loading results for watersheds from the Georgia EPD Assimilative capacity models. Impaired streams located within watersheds with relative low loadings could be targeted for management efforts.

CONCLUSIONS

Georgia EPD has developed a new tool to guide nonpoint source control activities toward prioritized watersheds. Over the next few years, nonpoint source management efforts will be directed toward these watersheds with the intention of restoring more watersheds to delisted status. Georgia EPD 31 Annual Reports will document progress toward these goals.

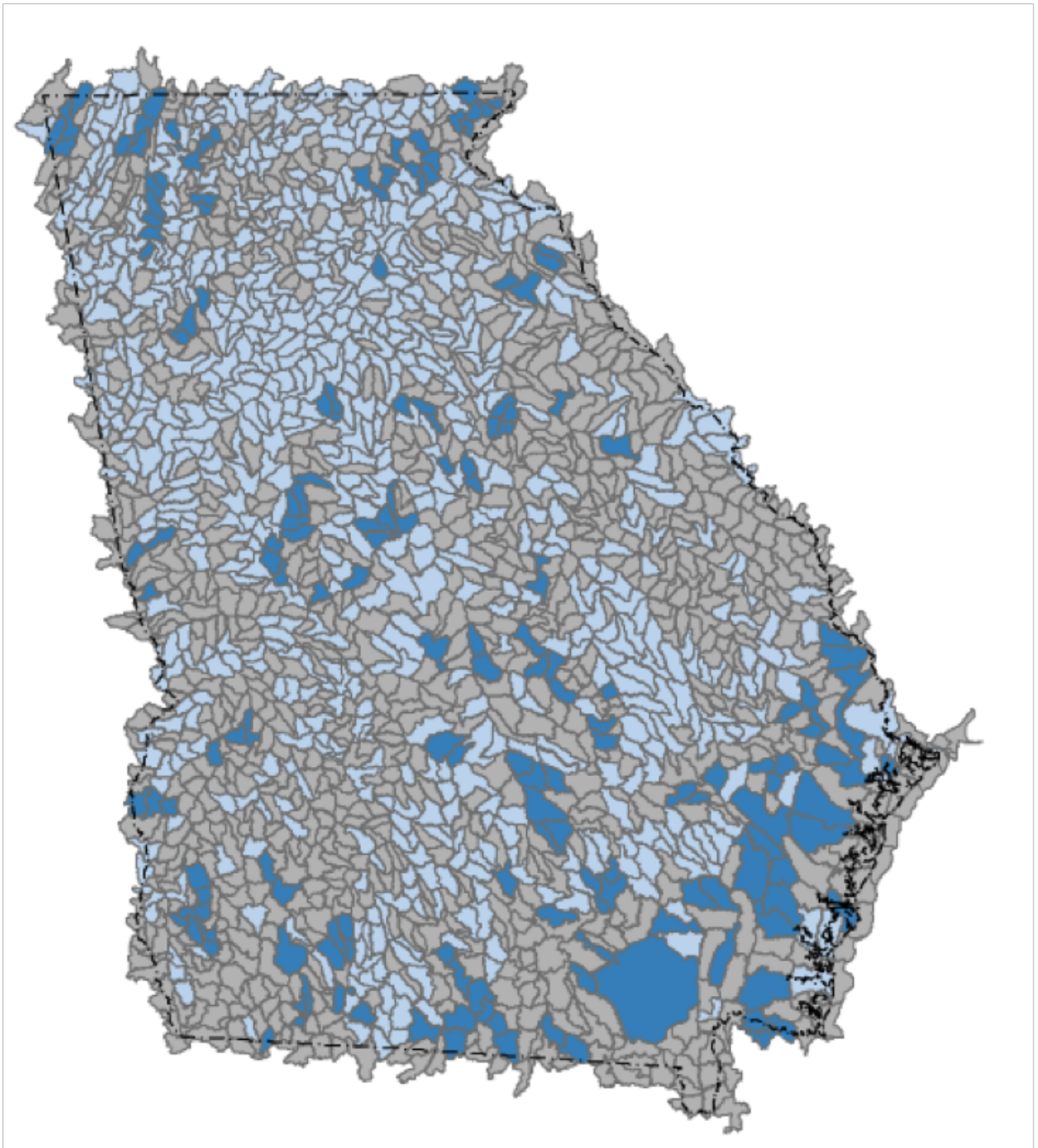


Figure 2: Map of prioritized watersheds in Georgia: Dark blue = prioritized; light blue = important, but not prioritized; gray = not impaired for pollutant of concern.

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