Relationships between Recreational User Perceptions and the Biological Condition of West Virginia Watersheds

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Geol659 Proposal
In West Virginia from 2008-2010 five hundred and twenty-eight contributing miles of streams were added to the 303(d) list according to the Department of Environmental Protection (DEP). West Virginia's 303(d) list continues to grow as streams do not obtain delisting status. Impairment not only has damaging effects on aquatic life and ecosystem function. It has effects on human well-being and the users of those waterbodies (Bingham et al. 1995). Social values typically are not considered relevant in watershed management and priority setting of impaired waters. To enact more sustainable and successful watershed improvements all stakeholders should be considered including water recreational users (Johnson et al. 2002).

I propose that relationships can be identified between user perceptions and the actual biological conditions of a river or stream segment. By comparing water-based recreational user perceptions to existing biological data, efforts can be put forth towards the improvement of West Virginia waters. The research questions addressed in this study are:

\( R^1 \): Is there a relationship between the biological conditions of West Virginia watersheds?

\( R^2 \): Are perceptions of biological condition spatially different depending on the HUC8 watershed?

\( R^3 \): Does perceived biological condition affect participation in water-based recreation?

\( R^4 \): Can measures of user perception assist with priority setting of impaired waters in West Virginia?
Responses from the survey are coded to be used for statistical analysis using Excel and R statistical software. Logistic and Poisson regression models will be used respectively. Logistic regression analysis can predict a binary response based on the perception of quality that could have influence on recreation participation (Dogaru 2009).

Spatial analysis for this study is based upon methods by Brody et al. 2005. To analyze geographic patterns a *global Moran’s I* significance test of spatial autocorrelation can be used to measure significantly clustered perceptions based upon an alpha of 0.05. Hot spot analysis can further determine which significant clusters can be deemed “hot” and “cold” spots at 90% and 99% confidence intervals. Hot or cold spots refer to geographic areas where perceptions are either clustered based on high values or low values

In identifying the relationships between recreational user perceptions and actual environmental conditions resource managers can seek and understand if water quality and biotic integrity are factors that determine use. A social perspective of our state waters has the potential in assisting watershed planners, state, and federal agencies to justify their investments, fulfill watershed targets, and use the initial data in evaluating future objectives (Curtis et al. 2005). Restoration projects can be targeted to areas of the highest priority for meeting the requirements of both aquatic life and recreational involvement.
Literature Cited


West Virginia Department of Environmental Protection. 2010. Integrated Water Quality Monitoring and Assessment Report. Division of Water and Waste Management