March 29, 2016

*To*:

Dr. Parker J. Wigington, Jr.

Editor-in-Chief

JAWRA

*From*:

Dr. Marcus W. Beck

US Environmental Protection Agency

[beck.marcus@epa.gov](mailto:beck.marcus@epa.gov), 850-934-2480

Dr. Rebecca Murphy

UMCES at Chesapeake Bay Program

[rmurphy@chesapeakebay.net](mailto:rmurphy@chesapeakebay.net)

Enclosed please find our manuscript, entitled “Comparison of weighted regression and additive models for trend evaluation of water quality in tidal waters”, to be considered as a technical paper in JAWRA. The increasing quantity of monitoring data in coastal environments requires the use of statistical methods that leverage the information provided by decadal time series. Two recently developed methods, Weighted Regression on Time, Discharge, and Season and Generalized Additive Models, have been used to describe long-term water quality trends in tidal waters, yet the quantitative merits have not been rigorously compared. Our paper provides an empirical description of each with application to a thirty-year time series of chlorophyll data in the Patuxent River Estuary. The models are also applied to simulated datasets to evaluate flow-normalized trends. We feel this information is timely as both methods are used by monitoring and regulatory agencies for trend analysis. A quantitative comparison that evaluates predictive performance and trend summaries will provide valuable guidance on appropriate use of statistical tools for trend analysis.

Please note that Drs. Jeffrey Chanat and Jeremy Testa have provided informal reviews of an earlier draft. Further, the co-authors work closely with Drs. Jim Hagy, Bob Hirsch, Jennifer Keisman, and Elgin Perry. Reviews by either of these individuals would be a conflict of interest. All figures are provided in color. Grey-tone images will be provided for print publishing should the manuscript be accepted. Please do not hesitate to contact us with questions regarding our manuscript. We greatly appreciate the opportunity to publish our work in JAWRA.

Respectfully,

Marcus W. Beck