# WATERSHEDS, ECOREGIONS AND HYDROLOGIC UNITS: THE APPROPRIATE USE OF EACH FOR RESEARCH AND ENVIRONMENTAL MANAGEMENT DECISIONS

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It has long been recognized that conditions at a point on a stream are highly dependent on conditions upgradient within the topographic watershed. The hydrologic unit (HU) system has provided a useful set of nationally consistent, hydrologically based polygons that has allowed for the generalization and tabulation of various conditions within the stream and its valley. However, environmental managers and researchers sometimes treat all hydrologic units as true topographic watersheds, resulting in an exclusion of many data upgradient of the sample point, or giving a misleading illustration of watershed conditions. Using ambient water quality data collected throughout South Carolina, we tabulated data at the 12 digit HU, 10 digit HU, 8 digit HU, and true topographic watershed scale for each sample point. For both the watershed, which we delineated by clipping, merging and/or dissolving hydrologic units, and the unaltered hydrologic units, total and percent area were computed for landcover and the level III ecoregion that made up each polygon. For each sample point along the stream, descriptive statistics were computed for common water quality parameters. For a given ecoregion, water quality parameters in tributary streams were more similar to each other than they were to measures taken from the main stem river into which they flowed. While this was not unexpected, we show how the common practice of extrapolating to the HU scale, in lieu of the topographic watershed, can mask spatial patterns and can potentially result in spurious conclusions. These results demonstrate the importance of integrating ecoregion and true topographic watersheds for the generalization of surface water data. This integration can lead to a better understanding of the natural world, which in turn can result in better management decisions.

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