

High Gradient Benthic Index (HGMI)¹

Study area: northern New Jersey, above the geologic fall-line including the following ecoregions: North Central Appalachians, Central Appalachian Ridges and Valleys, Northeastern Highlands, Northeastern Coastal Zone, and Northern Piedmont. See figure A1.

Index Metrics

1. Total number of genera_{adj} = $26.53 + \text{Metric} - [22.776 + 4.173 * \log_{10}(\text{areasqkm})]$
2. Percent of genera that are not insects
3. Percent sensitive EPT (excluding Hydropyschidae, including Diplectrona)_{adj}
= $37.49 + \text{Metric} - [49.922 - 13.800 * \log_{10}(\text{areasqkm})]$
4. Number of scraper genera_{adj} = $5.44 + \text{Metric} - [3.889 + 1.724 * \log_{10}(\text{areasqkm})]$
5. Hilsenhoff Biotic Index_{adj} = $4.23 + \text{Metric} - [3.407 + 0.918 * \log_{10}(\text{areasqkm})]$
6. Number of New Jersey TALU attribute 2 genera
7. Number of New Jersey TALU attribute 3 genera

ADJ (Adjusted metric value) = Mean_{reference} + Metric_{observed} – Metric_{predicted}, where predictions are based on linear regression analysis of reference metric values on catchment size.

<u>Assessment Rating</u>	<u>Score</u>
Excellent	≥ 63
Good	< 63 - 42
Fair	< 42 - 21
Poor	< 21

Reference

Benjamin Jessup, et al. Report. Development of the New Jersey high gradient macroinvertebrate index (HGMI). TetraTech, Inc. Owings Mills, MD. February, 2007.

Attributes

Excellent: Minimal changes in structure of biological community and minimal changes in ecosystem function. Virtually all native taxa are maintained with some changes to biomass and/or abundance; ecosystem functions are fully maintained within the range of natural variability.

Good: Some evident changes in structure of the biotic community and minimal changes in ecosystem function. Some changes in structure due to loss of some rare native taxa; shifts in relative abundance of taxa but sensitive-ubiquitous taxa are common and abundant; ecosystem functions are fully maintained.

Fair: Moderate to major changes in structure of biological community and moderate changes in ecosystem function. Sensitive taxa are markedly diminished; conspicuously unbalanced distribution of major groups from that expected; organism condition shows signs of physiological stress; system function shows reduced complexity.

Poor: Extreme changes in structure of biological community and major loss of ecosystem function. Extreme changes in structure; wholesale changes in taxonomic composition; extreme alterations from normal densities and distributions; organism condition is often poor; ecosystem functions are severely altered.

¹ Based on 100 organism subsample, genus level taxonomy