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Compendium of Tools/Methods to Estimate Environmental Benefits for Nature-Based Solutions: U.S. Environmental Protection Agency Report Addresses Water Quantity, Climate Mitigation, Air and Habitat

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The United States Environmental Protection Agency (“EPA”) issued a November 2024 report titled:

A Compendium of Tools and Methods to Estimate Environmental Benefits for Nature-Based Solutions - Environmental Benefits Related to Water Quantity, Climate Mitigation, Air and Habitat (“Report”).

See EPA-832-R-24-005.

The document was prepared EPA’s Office of Water and Office of Wetlands, Oceans, and Watersheds.

The Report’s introduction notes that state programs, cities and local communities s develop plans and implement best management practices to address water quality impairments. Some best management practices are stated to fall under the:

...umbrella of nature-based solutions and provide social, economic and environmental outcomes, or benefits to communities and watersheds.

Such environmental benefits are stated to be possibly of particular interest when considering hazard mitigation and offsetting the impacts of land use change.

EPA states that it developed this Report for states, tribes, local watershed groups, and others that may be interested in estimating environmental benefits - beyond water quality - at the planning level. The federal agency states that what it describes as a compendium:

...connects urban and agricultural nature-based solutions to publicly available tools and methods that quantify environmental benefits related to water quantity, climate mitigation, air and habitat.

Note that EPA defines “nature-based solutions” as:

...that protect, conserve, restore and sustainably manage natural or modified ecosystems.

They are stated to utilize natural features or processes to address public health and environmental challenges while providing multiple benefits to people and nature. The relevant actions are stated to potentially include:

...planning, design and maintenance of engineering practices that restore, use or enhance natural processes (e.g., green infrastructure, agricultural conservation practices and coastal restoration) or protect natural features to preserve ecosystem function (e.g., wetlands, forest, riparian areas and coral reefs).

Key chapters include:

- Water Quantity Benefits.
- Water quantity method and tools.
- Climate Mitigation Benefits.
- Climate mitigation tools.
- Air Benefits.
- Air quality improvements.
- Regional scale air quality tools.
- Local-scale considerations for air quality benefits.
- Ambient air temperature reduction.
- Ambient air temperature reduction tools.
- Habitat Benefits.
- Habitat assessment tools and metrics.
- Appendix A: Restoration versus Protection Actions.
- Appendix B: Literature Review – Systematic Abstract Screening.
- Methodology.
- Results.
- Appendix C: Referenced Equations.

A copy of the Report can be downloaded [here](#).