

LANDSCAPE AND PREDICTIVE TOOLS METHODS MANUAL

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ABSTRACT

A landscape and predictive tools methods manual, being developed collaboratively by EPA's Office of Water, Office of Research and Development, Regions and others, describes the purpose, rationale and basic steps for using landscape and predictive tools for Clean Water Act monitoring, assessment and management purposes. Interdisciplinary integration of geographic frameworks, methods to document stress or pressure gradients, methods to build predictive models relating stress(es) to response(s), and approaches to extrapolate to areas lacking in-situ data to answer key water quality monitoring (and other) questions are emphasized. Landscape and predictive tools have a wide range of current and potential applications including: criteria and standards development, problem identification and prevention, prioritization and targeting of rehabilitation, and advancing science, education and society's ability to effectively manage aquatic and terrestrial resources.

Adding landscape and predictive tools to our water quality monitoring arsenal involves four essential steps: 1) use appropriate geographic frameworks, including mapped areas such as ecoregions or other appropriate classification approaches, to establish realistic areas for analysis and extrapolation, 2) use "wall-to-wall" landscape and other data to document stress gradients, 3) construct empirical relationships or models linking landscape and other stress indicators to in-situ response, and 4) use these relationships to extrapolate to places lacking in-situ data. Estimating the condition of places lacking data can greatly expand the usefulness of our limited site-specific data. Regular use of landscape and predictive tools can support comprehensive, systematic priority setting and targeting for monitoring, rehabilitation and prevention actions. Using these tools as a matter of course will require ongoing commitment to training, continued collaborative development of applications, new techniques and data, and consistent effort to bring these scientific advances to bear on our water quality monitoring, assessment, rehabilitation and protection efforts.

KEYWORDS

Monitoring, landscape, stress-response, extrapolation, targeting, priority setting, rehabilitation, prevention