



Project Summary

Guidelines for Deriving Numerical Aquatic Site-Specific Water Quality Criteria by Modifying National Criteria

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A major goal of the U.S. Environmental Protection Agency is to directly link regulatory decision-making regarding priority water bodies to the capacity of those water bodies to receive wastewater discharges and still maintain acceptable water quality. To assist states in achieving this goal in a consistent, cost-effective manner, the Office of Research and Development (ORD) has developed a new approach to water quality criteria derivation fully described in the final report "Guidelines for Deriving Numerical Aquatic Site-Specific Water Quality Criteria by Modifying National Criteria."

These guidelines provide a series of protocols for modifying national water quality criteria to reflect local environmental conditions. The national criteria serve as benchmarks to protect the biological integrity of all water bodies and may require adjustments for site-specific applications. The new protocols take into account site-specific variations in species composition, physical factors, and chemical water quality variables. Consideration of local conditions assures that criteria for a given water body are tailored specifically to its aquatic life and uses.

This Project Summary was developed by EPA's Environmental Research Laboratories: Duluth, MN; Narragansett, RI; Corvallis, OR; Gulf Breeze, FL, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Technical Discussion

Section 304 of the Clean Water Act directs EPA to publish and periodically review water quality criteria for the protection of public health and welfare, aquatic life, and recreation. The water quality criteria incorporate data on aquatic plants and animals which occupy various trophic levels, in addition to applying current scientific judgments relating pollutant concentrations to environmental and health effects. These water quality criteria are then used by the states to formulate ambient water quality standards.

States can use site-specific and national criteria to develop enforceable numbers such as water quality standards, mixing zone guidance, or water quality-based effluent limits. The development of such standards or limits takes into account additional factors such as the water body usage at the site, environmental and analytical characteristics of chemical pollutants, accuracy of extrapolation from laboratory data to field situations, and the relationship between the species for which data are available and the body of water which is to be protected.

Implementation of criteria modification process requires site selection, data collection and evaluation, biological and water quality sampling and toxicity testing, and ultimately, generation of site water quality criteria.

There are three procedures in the ORD Guidelines for modifying national criteria to develop site-specific criteria.

- A recalculation procedure to account for differences in selected resident species sensitivity to a chemical. This procedure is the least labor intensive and the least costly, since it may require no additional toxicity tests.
- An indicator (resident or non-resident) species procedure to account for differences in the biological availability and/or toxicity of a pollutant that is affected by the physical conditions and chemical characteristics of the receiving water.
- A resident species procedure to account for differences in both species sensitivity and ambient water quality. This procedure is the most resource intensive and, therefore, the most costly since it may require a large number of acute and chronic toxicity tests with resident species in site water.

To perform these procedures, the ORD final report provides a recommended list of state-of-the-art methods for toxicity tests with aquatic organisms, which include fishes, invertebrates, and plants.

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The complete report, entitled "Guidelines for Deriving Numerical Aquatic Site-Specific Water Quality Criteria by Modifying National Criteria," (Order No. PB 85-121 101; Cost: \$8.50, subject to change) will be available only from:

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