



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: AZ961

Title: Develop Bioassay Capability for Modification of Water Quality Criteria & Effluent Testing Using Arid West Aquatic Species

Focus Categories: Water Quality, Surface Water

Keywords: Arid Climates, Fish Ecology, Heavy Metals, Lakes, Organic Compounds, Pollutants, Regulatory Permits, Risk Management, Rivers, Toxic Substances, Wastewater, Water Quality, Water Quality Management, Water Quality Standards.

Start Date: 03/01/2001

End Date: 02/28/2002

Federal Funds: \$11,276

Non-Federal Matching Funds: \$24,532

Congressional District: Fifth

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Abstract

Description of Problem: Most states and Indian Nations establish water quality standards for surface waters within their geographic area of responsibility using a national database of aquatic organism toxicity data developed by the U.S. Environmental Protection Agency. The aquatic species employed in the EPA bioassays reflect taxa found in perennial streams of the non-arid regions of the nation. A few arid states have been able to justify modified standards by demonstrating that no fish, let alone fish used by EPA can live in certain arid streams, but other arid states have had to accept EPA numerical criteria for heavy metals, conventional pollutants (e.g., ammonia, chlorine), and toxic organic compounds irrespective of the absence of comparable fish habitat in ephemeral, effluent dependent watercourses of the arid West. Additionally, bioassay species used by EPA to regulate effluent discharges (Whole Effluent Toxicity Tests) are believed not representative of aquatic species found in arid West watercourses.

Conferees at a meeting to discuss research needs for arid West water quality criteria concluded bioassay techniques incorporating exposure conditions representative of arid West waters, and use of representative species would improve risk assessment and efficient risk management of river and lake water quality. Without improvements, many municipal and wastewater dischargers may be expending funds to treat effluents to a degree higher than required by the Clean Water Act, or alternatively reusing treated effluents rather than maintaining aquatic and riparian habitats in an ephemeral watercourse.

Methods: Trial toxicity determinations with a standard toxicant (e.g., copper) will be conducted. These data and demonstrations would then be evaluated as to usefulness in general arid West practice, and for their compatibility with EPA requirements for sensitivity and representativeness. If determined acceptable additional tests will be undertaken with input from EPA Region 9 and possibly others in the five regions with arid or semi-arid western watercourses.

Objectives: Improved bioassay protocols will be developed, allowing states to have better prospects for acceptance of modified criteria. Results from the proposed project could assist the projected EPA-funded Arid West Water Quality Research Project (WQRP), and could contribute to the overall scope of the WQRP project at little or no additional cost. Also, the project will develop and demonstrate maintenance of culture stock of several candidate arid West fish and invertebrate species, demonstrate survival in mock (control) bioassay procedures, including in relation to standard EPA species.