FY 2009 RESEARCH PROBLEM STATEMENT

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TITLE

Trace metals inventory in roadside streams

PROBLEM (Description of need)

Trace metals such as lead, copper, nickel and zinc are often found in higher concentrations in streams along roadways than would be expected in natural conditions. Elevated levels of these trace metals can have detrimental effects on fish, wildlife and even human health. However, there is little comprehensive knowledge of actual levels of these trace metals on a regional basis. Most previous studies have focused in on a single watershed at a single point, which provides little insight into which nonpoint sources may be contributing to elevated trace metal concentrations.

PROPOSED RESEARCH, DEVELOPMENT OR TECHNOLOGY TRANSFER ACTIVITY

Proposed research would take advantage of the existing USGS streamflow network to further understanding of trace metal sources and distribution. Data from USGS, DEQ and Storet will be reviewed. There are several USGS streams with more than one gage along its length. Such streams which contain at least one gage in an uninhabited/rural area and another gage along a roadway in a more urban setting provide ideal scenarios in which to analyze trace metal distribution. Sediment and water samples will be taken five to six times a year at each streamflow station. Sediment and water samples will be analyzed for trace metals using the atomic emission optical spectroscopic technique. The lab work will be performed in conjunction with Portland State University and/or a private lab. GIS techniques will be utilized to determine the levels of urbanization, percentage of impervious surface and proximity to roadways for each station.

BENEFITS

More comprehensive knowledge of trace metal sources and distribution will enable ODOT to better plan where larger riparian buffer zones are needed for both existing and new roads in compliance with the Clean Water Act section 304(a). Also, in some instances traffic patterns can be altered for the same net benefit. Accumulation of trace metal data can also provide a benchmark for which future mitigation efforts can be measured.

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