USGS

WATER RESOURCES RESEARCH GRANT PROPOSAL

Title: A Watershed Scale Study on No-Till Farming Systems for Reducing Sediment Delivery

Focus Categories: SED, AG, MOD

Keywords: sediment delivery, best management practice, watershed, soil erosion, water quality, watershed management, runoff, conservation farming

Duration: 9/99-8/02

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Non-Federal Matching Funds Pledged: $146,006

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Abstract

The new listing of several salmon species as threatened or endangered by the National Marine Fisheries Service, under provisions of the Endangered Species Act, has great impacts upon the practices and sustainability of agriculture in the Pacific Northwest. Because of the potential effects of sediment and other agricultural chemicals on water quality and fish habitats, there will be an increasing need for the control of soil erosion, associated sediment, and chemical loading to the streams. No-till farming has been adopted as a conservation culture practice to reduce soil erosion. The effectiveness of this practice, however, has not been extensively evaluated at a watershed scale, and tools for predicting sediment loading at a watershed level have not been verified for this area.

The goal of this project is to quantify sediment delivery from an agricultural watershed with no- till agriculture practices. Specific objectives are (1) to compare soil loss from no-till and conventional farming fields, (2) to evaluate different approaches for predicting sediment delivery at a sub-watershed level, and (3) to develop a model for predicting sediment delivery from an entire watershed.

This three-year research project will be conducted through field plot evaluation, sub-watershed tests and stream water quality monitoring. The experimental site will be the Pataha Creek watershed, a model watershed located in southeast Washington. This research will evaluate soil loss from individual fields, relate the soil loss to sediment delivery from sub-watersheds and finally, develop the model for the entire watershed. Several modeling approaches to sediment delivery will be evaluated. Modification to these models will be made to relate the model with local conditions and some watershed attributes, primarily average upland slope, flood plain slope, channel slope and the size of the watershed.

The project team will consist of university researchers, a UDSDA scientist, and a USGS scientist. Collaborators of the project will include the Pomeroy Conservation District, NRCS, the Forest Service, and the Washington Department of Fish and Wildlife. The results can provide on-site field evaluation and documentation of the effectiveness of BMPs for water quality improvement, an in-,depth understanding of the sediment delivery process, and a tool for assessing the amount of sediment delivery from agricultural watersheds. The research results can not only help farmers to make management decisions, but can also enable related agencies to make well-grounded recommendations