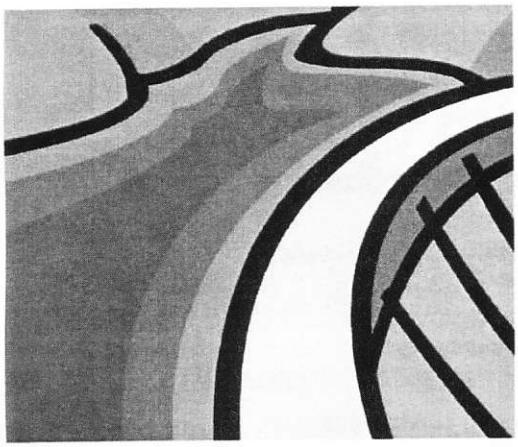

From Dust Bowl to Mud Bowl:
Sedimentation, Conservation Measures and the Future of Reservoirs

September 14-16, 2009
Westin Crown Center
Kansas City, MO

The goal of this conference is protection and conservation of reservoirs, a critical water resource in much of the U.S., by advancing interdisciplinary science, research, collaboration and problem solving regarding conservation practices and sedimentation of reservoirs. It will provide a unique opportunity to tie ongoing and needed research, extension, and education in conservation practices directly to the health and sustainability of federal reservoirs.

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Watershed Hydrology

4:00 – 6:00 pm Concurrent Sessions

Concurrent Session III-B.

Best Management Practices and Targeting in Mixed Use Watersheds

Moderator: Mike Smolen, Oklahoma State University

4:00 Vegetative Buffers and Targeting in Watersheds
Michael Dosskey, USDA-Forest Service

4:20 Using SWAT to Target and Assess BMP Implementation in Watersheds
Kyle Douglas-Mankin, Oklahoma State University

4:40 Computing Time-Series Suspended Sediment Concentrations and Loads from In-Stream Turbidity-Sensor and Stream Flow Data
Patrick Rasmussen, USGS

5:00 Restoring Urban Watersheds Using Wetlands and Other BMPs
Dennis Haag, Burns & McDonnell

5:20 Sediment Control Technologies for Urban and Suburban Landscapes
Beth Chesson, Civil & Environmental Consultants, Inc.

5:40 Physical and social barriers to watershed management - lessons from the mid-Atlantic and Northeast U.S.
Tony Buda, USDA-ARS

Vegetative Buffers and Targeting in Watersheds

Mike Dosskey, USDA Forest Service, National Agroforestry Center
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Vegetative buffers such as filter strips and riparian buffers are important components of strategies for reducing sediment and nutrient loads to streams that drain agricultural landscapes. A consensus scientific opinion holds that vegetative buffer strips in many field settings can trap about half of incoming sediment and lesser amounts of sediment-bound and dissolved nutrients. There is, however substantial variation around this general estimate since site conditions that largely determine level of performance, such as land slope and soil properties, can vary widely. This implies that buffer performance will differ from place to place. Furthermore, because we know the spatial patterns of topography and soils, we can identify and target locations where performance likely will be greater than in others. Two methods have been developed for targeting vegetative buffers. Terrain analysis uses topographic information to identify locations where runoff flow converges from uplands onto relatively flatter slopes. These locations can be critical pollutant source areas and have better conditions for intercepting pollutants and, therefore, represent better locations for installing buffers. A different method employs soil surveys to identify map units where soil and slope conditions are relatively favorable for trapping pollutants in overland flow. Index values are calibrated to estimate trapping efficiency for a standard buffer design below a cultivated field on that map unit, enabling buffer performance to be quantified. The soil survey method focuses on the filtering function of buffers, whereas terrain analysis focuses on the loading function. Since performance of buffers commonly involves both functions, future improvement may come from combining elements of both methods. Both methods should be used with an element of caution. For example, accuracy of digital data sources (DEM, SSURGO, Land Use/Land Cover) for describing actual site conditions may be an issue in some watersheds, especially in intensively developed and artificially drained watersheds. At this time, our understanding of site-scale performance of vegetative buffers is well-advanced and it indicates that targeting buffers to specific locations within watersheds should significantly improve their effectiveness and lower the costs for reducing sediment and chemical loads to streams and reservoirs.

Keywords: vegetative buffers, filter strip, riparian buffer, sediment, nutrients, targeting, watershed, methodology

Terrain Analysis = intuitive, simple
Soil Survey = not simple or intuitive