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Standard Guide for Monitoring Sediment in Watersheds[1]

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INTRODUCTION

Soil erosion and resulting sedimentation is the major cause of nonpoint source pollution that threatens water resources. These impacts include: impaired aquatic habitat; destruction of sport and commercial fisheries and shellfisheries; lost reservoir capacity for flood control, power generation, and storage of potable water supplies; excessive flooding; impaired navigation; aggradation of irrigation and drainage channels; lost productivity of lands swamped by deposition and infertile overwash; increased levels of water treatment; lost or declined recreational opportunities; and impaired aesthetic values. The amount of sediment in a stream can affect channel shape, sinuosity, and the relative balance between riffles and pools. Excessive sediment in a stream causes a decrease in channel capacity which in turn results in more frequent and larger out of bank floods. In addition to the adverse physical effects of sediment loads, many nutrients, pesticides, and heavy metals are sorbed onto fine sediment particles which may result in eutrophic or toxic waters. Indirect effects of increased sediment loads may include increased stream temperatures and decreased intergravel dissolved oxygen levels.

This guide recommends a process for developing and implementing monitoring projects for sediment in a watershed. It follows Guide D5851 with more specifics applicable to watersheds and sediment.

These guidelines are presented for use in the nationwide strategy for monitoring developed by the Intergovernmental Task Force on Monitoring (ITFM). The nationwide monitoring strategy is an effort to improve the technical aspects of water monitoring to support sound water-quality decision-making. It is needed to integrate monitoring activities more effectively and economically and to achieve a better return of investments in monitoring projects (**1**)[2].

This guide is offered as a guide for standardizing methods used in projects to monitor and evaluate actual and potential nonpoint and point source sediment pollution within a watershed. The guide is applicable to landscapes and surface water resources, recognizing the need for a comprehensive understanding of naturally occurring and manmade impacts to the entire watershed hydrologic system.

1. Scope

1.1 *Purpose*—This guide is intended to provide general guidance on a watershed monitoring program directed toward sediment. The guide offers a series of general steps without setting forth a specific course of action. It gives advice for establishing a monitoring program, not an implementation program.

1.2 Sedimentation as referred to in this guide is the detachment, entrainment, transportation, and deposition of eroded soil and rock particles. Specific types or parameters of sediment may include: suspended sediment, bedload, bed material, turbidity, wash load, sediment concentration, total load, sediment deposits, particle size distribution, sediment volumes and particle chemistry. Monitoring may include not only sediments suspended in water but sediments deposited in fields, floodplains, and channel bottoms.

1.3 This guide applies to surface waters as found in streams and rivers; lakes, ponds, reservoirs, estuaries, and wetlands.

1.4 *Limitations*—This guide does not establish a standard procedure to follow in all situations and it does not cover the detail necessary to define all of the needs of a particular monitoring objective or project. Other standards and guides included in the reference and standard sections describe in

[1] This guide is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.02 on Quality Systems, Specification, and Statistics.

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[2] The boldface numbers given in parentheses refer to a list of references at the end of this standard.

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