Assessing Military Training Land Condition with Continuous Real-Time Monitoring Strategies

Texas A&M AgriLife Research Blackland

Environmental Monitoring

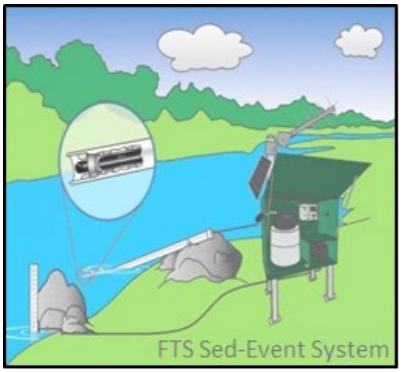
Water quality monitoring provides a convenient method to indirectly estimate erosion related to maneuver activities and implemented land management practices.

The Blackland Research & Extension Center's (BREC) Water Quality and Environmental Instrumentation Laboratory has monitored stream flow and associated sediment export from many Fort Hood, Texas training areas since 1995.

The data has been used to provide quantitative measurements of runoff, erosion, and Best Management Practice effectiveness (Hoffman & Wolfe, 2002; Wang et al., 2009; Wilcox et al., 2012).

Improvements in Instrumentation and Monitoring Strategy

Improvements in sensors, data recording technology, telemetry, and Internet-based information distribution are currently driving Federal, State, and non-governmental organizations development of real-time monitoring strategies (Rasmussen et al., 2009).



Continuously recorded sensor data, combined with non-continuous water quality analysis, can yield statistical relationships between sensor measurements and constituents that cannot be measured directly. For example, electronic turbidity can be used as a surrogate to accurately calculate suspended sediment concentration (Lewis 1996).

A similar approach may be used for other water-quality constituents such as bacteria, nutrients, metals, and organics. Computed estimates of water quality can be made available in near real-time at significantly decreased costs, compared to manual sample collection and analysis. Computed values are being used by water-management agencies for a wide variety of issues including water regulation, total maximum daily loads, recreation, and water treatment.

Advantages of Continuous Monitoring

- Decreased time and cost associated with manual sampling
- Better representation of actual conditions relative to infrequent manual samples
- Richer data sets for developing management tools (i.e., mathematical models)
- Collected at night and during storm events, when data is seldom collected manually
- Facilitates rapid response for developing conditions and issuing public warnings
- Promotes expansion of real-time water-quality data

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