Kansas Water Resources Institute

Sediment Baseline Assessment:

Seven entities are working jointly on a sediment baseline assessment for a comparative watershed study on three small lake watersheds in Northeast Kansas. This research is a top priority of the state, as identified by the Kansas Water Office, and is part of a larger strategy to address sedimentation in Kansas reservoirs, due to the fact that federal reservoirs in Kansas represent the public water supplies for approximately 2/3 of the state's population.

The study watersheds were selected based upon availability of existing information from previous research efforts and presumed large differences in the range of sediment loads between them. Each study watershed is similar in size and located within the same ecoregion in Kansas. Watershed characteristics for assessment are: geomorphology, hydrology, geology/soils, riparian condition, land use, biology and chemistry.

The characterization of each of the study watersheds is intended to relate those characteristics to the sediment loads in each watershed. Ultimately, the management goal is to change the characteristics in watersheds with larger sediment loads to emulate the characteristics in watersheds with smaller sediment loads and use the monitoring to determine the management practice effectiveness toward that reduction.

Proposed Research Methodologies:

Kansas Biological Survey:

•Perform bathymetric (lake depth) surveys.
•Perform sediment surveys by coring and laboratory analysis of texture, bulk density and phosphorus content.

University of Kansas Civil, Environmental and Architectural Engineering:

•Field reconnaissance.
•Aerial videography (via helicopter) and analysis of footage.
•Comparison of field surveys with video footage.

The Watershed Institute:

•Focus reach-scale geomorphology site selection using hydrology, litho-stratigraphy, and channel evolution determination.
•Survey the physical dimensions of the channel, document streambank stability charactics, and note general conditions of the riparian corridor.
•Classify each stream reach.
•Monitor on the stream cross section and profile lateral erosion and erosion/deposition of the stream on a quarterly basis for three years.

U.S. Geological Survey:

•Characterize the hydrology to define baseline sediment loads and yields.
•Determine the annual changes in reservoir contents and estimate of annual inflow to record capacity changes.
•Determine sediment concentrations at the outflow site.

Kansas Geological Survey:

•Create maps that show the distribution of the members of the Deforest Formation in the valleys of streams.
•Create maps with ranked stream reaches from most to least vulnerable for bank erosion and sediment yield.

Kansas State Research and Extension and KansasForest Service:

•Obtain existing GIS databases and verify, validate and augment data using local experts and ground truthing.
•Conduct soil assessment.
•Map infiltration rates.
•Identify target areas for treatment (cropland, grassland, riparian areas and streambanks.

K-STATE Research and Extension
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Kansas State University Agricultural Experiment Station and Cooperative Extension Service
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KWRI Mission
The Kansas Water Resource Institute develops and supports research on high priority water resource problems and objectives, as identified through the state water planning process. It is also designed to facilitate effective communication between water resources professionals and to foster the dissemination and application of research results. For more information, contact: Steven Graham, Interim Director, 143 Waters Hall, KSU, Manhattan, KS 66506 (785)532-7108.