



**US Army Corps
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Engineer Research and
Development Center

Fact Sheet

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REMR MANAGEMENT SYSTEM FOR TIMBER DIKES

The Problem

Timber dikes are often used in rivers to control water flow so that a favorable channel can be formed in reaches where the channel had previously been inadequate for navigation. They can create more favorable channel alignment for navigation and help maintain the channel depth by reducing the cross-sectional area of the river. This reduced area increases the flow velocity in the shipping channel, which reduces sediment buildup. Most of the timber dikes maintained by the U.S. Army Corps of Engineers are used to maintain channel depth and their benefits are usually measured in terms of reducing dredging costs.

The primary cause of component failure in timber dikes constructed of untreated timber is rotting caused by wood-destroying fungi. Because the fungi must have air as well as food and moisture, the rotting is limited to the portion of the timber exposed to the air. However, this can eventually result in destruction of large sections of the dike. Corps personnel responsible for maintenance and repair (M&R) of these structures need a comprehensive decision support tool for project prioritization and efficient allocation of scarce M&R dollars.

The Technology

To assist those involved in M&R project planning and budgeting for timber dikes, the U.S. Army Construction Engineering Research Laboratory (CERL) is developing a Repair, Evaluation, Maintenance, and Rehabilitation (REMR) Management System. This computerized management system is based on standardized inspection and condition rating procedures for timber dikes. It also includes software for handling and storing data, performing required calculations, and producing a variety of reports for work planning and budgeting purposes.

The management system features a 100-point Condition Index (CI) which is a measure of the structure's ability to perform its intended function (see CERL Fact Sheet CF-22, The Condition Index). The CI allows the objective comparison of the condition of different structures. It also provides a means for monitoring the changes in individual structure condition over time. The factors that relate to the structural integrity, serviceability, and safety of the structure are weighted in the process of determining the CI.

The CI is determined from visual inspection and the component age data. Consideration of the component age is important for CI evaluation because the dike components do not show signs of distress over most of their service life, and the time span between detection of distress and failure is relatively short. Three dike components are considered in the CI: outer dolphin (a cluster of 10 piles that anchors

the river end of the dike), dike piles, and spreaders. The CI is obtained by taking a weighted average of the component CI.

After the CI is determined, various alternatives are formulated into a set of M&R solutions. The program then provides consequences for these alternatives and performs a cost analysis for each.

Benefits/Savings

This REMR Management System for timber dikes provides objective procedures for condition inspection and evaluation, an automated procedure for M&R quantity estimation, and a data base manager. The ultimate goal is to achieve the best possible condition for these structures at any funding level.

Status

The REMR Management System for timber dikes has been tested, validated, and implemented by the U.S. Army Corps of Engineers, Portland District. The rating system was designed specifically for Shallow Draft (less than 40') timber dikes found on the Columbia River. The most current REMR software is available on the Internet at <http://www.cecer.army.mil/fl/remr/remr.html>

Point of Contact

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