

Coastal Bluff Stabilization through Active and Passive Dewatering – Section 227 Demonstration Project, Allegan County, Michigan

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Presenter's Biography:

Jim Selegean has been working as a Hydraulic Engineer for the US Army Corps of Engineers, Detroit District for 14 years. He holds a B.S. in Civil Engineering, an M.S. in Environmental Engineering, an M.S. in Aquatic Biology and a Ph.D. in Environmental Engineering, from Wayne State University. Previous research and experience has dealt with numerical modeling of rivers, waves and sediment transport.

Abstract:

A significant factor in bluff failure is a buildup of groundwater behind the frozen bluff face in winter months. Slumps in the bluff face are most prevalent and movement is greatest when perched groundwater levels are high. Groundwater buildup adds weight to the bluff and reduces friction between individual soil particles, thereby reducing the soil strength. Minor increases in perched groundwater levels have been shown to result in significant bluff movements.

The purpose of this bluff dewatering demonstration project is to reduce groundwater levels in the bluff face during the winter and spring to levels typically found in the summer when the bluffs are stable. By removing the excess groundwater before it initiates failure, slope movements of the bluff face should be greatly reduced or eliminated.

Three sites along Lake Michigan in Allegan County, Michigan, were selected for the demonstration project. The dewatering demonstration project will extend over a five-year period, and contains both vertical, actively pumped wells, and horizontal drain wells. Findings from the first year of dewatering will be presented.