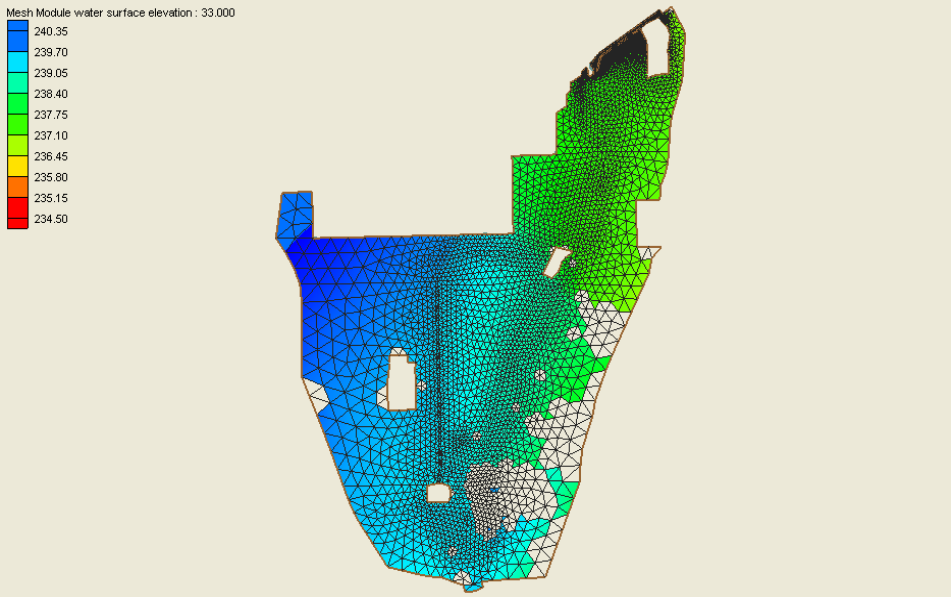
TWO-DIMENSIONAL MODEL FOR FLOOD SIMULATION IN THE RED RIVER VALLEY

Manitoba Floodway Expansion Authority **Winnipeg, Manitoba**



Project Description

As part of the preliminary design for the Floodway Expansion Project, KGS Group developed a two-dimensional finite element model of the Red River Valley to simulate flood conditions and to determine wind setup along the West Dyke, East Dyke, and at the Inlet Control Structure. The two-dimensional modeling software that was used for this analysis is called “Surface Modeling System” (SMS). SMS is a powerful, 2-dimensional, finite-element, surface water modeling package, which can be used to simulate river flows in conditions ranging from simple open channel rivers to complex networks of river channels.

Wind setup is defined as the vertical increase in the stillwater surface toward the side to which the wind is blowing of a body of water caused by wind stresses on the water surface. A wind shear stress component was incorporated as part of the SMS model to determine the wind setup for 12 design wind conditions. Design conditions were considered for Southeast, South, and East wind directions. The results from the design wind conditions were compared to determine the maximum wind setup for a 700 Year Flood, with consideration of the Expanded Red River Floodway.

KGS GROUP CONSULTING ENGINEERS