

Iowa DOT Flood Monitoring

When the spring rains combine with the melting snows from the north, the rivers in Iowa can unleash a devastating torrent of floodwater. State officials trying to monitor and coordinate response have often been overwhelmed by how widespread the flooding has been.

As a result of the 2008 floods, the Iowa DOT initiated a pilot project that will allow real time monitoring of, and response to over-topped roads and bridges in the affected watersheds. The project targeted a number of affected areas and WHKS was asked to focus on the Upper Cedar watershed, one of the worst hit regions.

The overall goal of the project is to enable remote identification of problem areas in real time during a flooding event. The first phase identified the areas along roadways where flooding would impact the road. These were primarily at bridge crossings, but also in low-lying areas.

The team reviewed the existing roads and bridges and discovered that, since many were designed in a pre-GPS era, they were built using different and often inconsistent coordinate systems. Crews re-surveyed all the structures and re-calibrated them to a consistent system of coordinates and elevations.

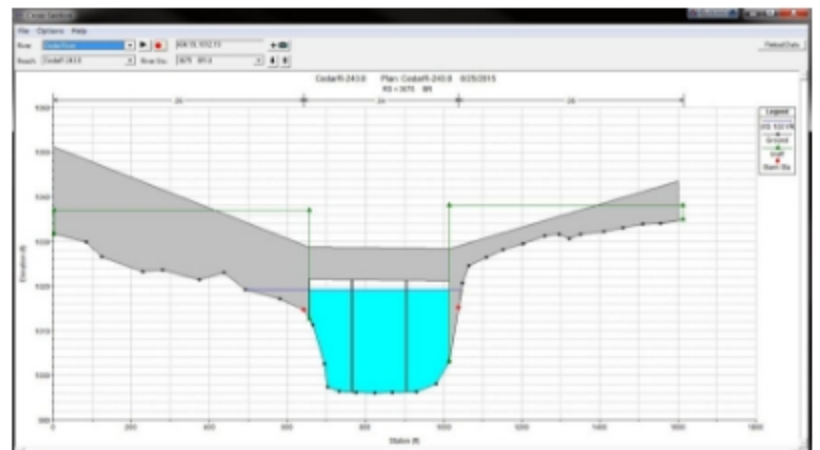
The goal was to remotely identify an emerging problem area using remotely monitored stream gauge and NEXRAD rainfall data. This required the compilation and coordination of reams of old, new and sometimes questionable data.

The second phase assembled the flood models for the various channels from FEMA, the USGS, DOT and any other existing sources. In the cases where no flood model existed, the team developed new ones. Rating curves were developed to compare flow rates to flood elevations and all the data was brought together into a master database, linked to the Iowa DOT GIS system.

This cutting edge project, initiated by the Iowa DOT, is one of the first of its kind. By monitoring real time stream flow and being able to remotely predict a flooding event, the DOT is developing an early warning system and providing a great opportunity to improve safety, allocation of resources, and response time.



Survey/Data Correction



Hydraulic analysis



GIS Database