A GIS STUDY OF THE MOHAWK RIVER WATERSHED USING DIGITAL ELEVATION MODELS

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The Mohawk River and its tributaries have a watershed pattern that is worthy of studying. It runs mostly eastward with eleven dams along its path and major creeks. The river's Schoharie Creek has three major dams (Gilboa Dam, Blenheim Gilboa Upper Dam, and Blenheim Bilboa Lower Dam, Schoharie County). In addition, many smaller dams can be found in the Mohawk River's tributaries. Figure 1 shows the multitudes of dams in the area of the river's watershed with the ones on the river's main path and on its Schoharie Creek highlighted. Figure 2 shows a hillshade layer generated from a digital Elevation Model (DEM) [NED Shaded Relief, 1 arc second] with streams and water bodies layer superimposed on top.

Most of the dams on the Mohawk River and within its watershed are classified as high (H) hazard, and only a few are classified as slight (S) hazard or low (L) hazard (Figure 3). The Mohawk River has two major pour points. Based on the contour lines generated by the DEM shown in Figure 4, the Schoharie Creek pours into the Mohawk River, and the maximum discharge is measured at the pour point near Cohoes where the Mohawk confluences with the Hudson River.

Delineation of watersheds can be done at different spatial scales. A large watershed may cover an entire stream system with smaller watersheds for each tributary. Delineation of watersheds can also be area-based or pointbased. An area-based method divides a study area into a series of watersheds, one for each stream section. A point-based method derives a watershed for each select point. Select points may be an outlet, a gauge station, or a dam. Figure 5 shows area-based delineation of the Mohawk River watershed. Point-based delineation will also be presented for major outlets and dams along the Mohawk.

Figure 6 shows a DEM-based, rastergenerated TIN of the Mohawk River watershed. This mode of presenting the terrain helps in the delineation process of the watershed since the first step in developing a watershed is to produce a filled DEM. A filled DEM or elevation raster is void of depressions. A depression is a cell or cells in an elevation raster that is/are surrounded by higher elevation values, and thus representing an area of internal drainage. Using this how procedure illustrates watershed delineation varies with the selection of different pour points. Figures showing these different possibilities will all be presented.

References

http://seamless.usgs.gov/ http://www.nationalatlas.gov/

In: Cockburn, J.M.H. and Garver, J.I., Proceedings from the 2009 Mohawk Watershed Symposium, Union College, Schenectady NY, 27 March 2009



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Fig. 3. High, Low, and Slight hazard dams.



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