Background:

Flash flooding is a common phenomena in Canada during summer season. Affected areas are cities/towns in the valleys or on the bank of rivers. In BC, Canada flash flooded was reported in the newspaper in the mid of May 2018 affecting Grand Fork town and surrunding areas. The location and the flooded picture have been shown in the following figures.

Grand Fork BC Canada

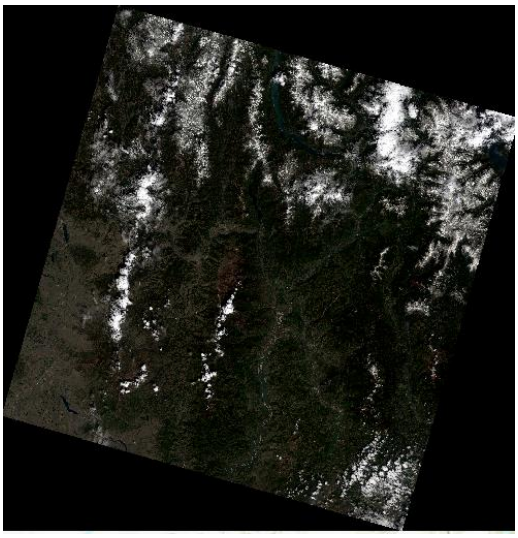
Grand Fork flood in the news (The mail and globe)

Objective:

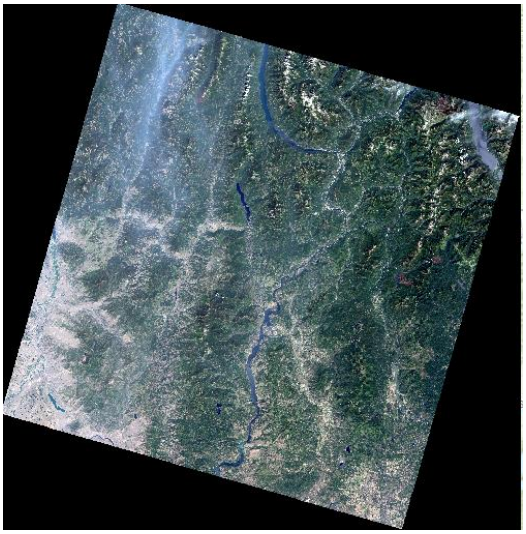
The objective of this assignment is to determine the flooded area extent surrounding Grand Fork, BC area with the help of ArcGIS tool.

Data collection:

Two Landsat image were collected from USGS website containing the Grand Fork, BC location for 10 May 2018 and 26 May 2018. The first image will be regarded as flooded image and contains 11% cloud cover. The second image will be regarded as unflooded image as flash flooding was gone after couple of days. The image has cloud cover of .3 %.



LANDSAT RGB image capturing Grand Fork BC in 10 May 2018 (flooded)



LANDSAT RGB image capturing Grand Fork BC in 26 May 2018 (unflooded)

Work procedure:

The flooded image (B2/B3 and B4 channels) was converted to raster by 'composite bands' tool. With the help of 'maximum likelihood classification' tool pixels were classified into 4 classes (water, Forest, rock and cloud_snow). Each class has 10 training samples. The 4 classes raster was then converted to binary mask. 1 representing water and 0 other classes with the help of 'Con' tool. The similar process was applied

to the unflooded image. The flooded and unflooded binary raster then made an operation Abs(flooded_water-unflooded_water) with the help of 'raster calculator' to determine only flooded extent. Finally with 'calculation field' total flooded extent was calculated based on the calculation [VALUE]*[COUNT]*.9*30*30/1000000. COUNT field shows number of '1' value pixel. 30 is to represent pixel extent in 30 m. 1000000 is to convert the area into KM from M. .9 scaling factor used as a trade of, there might be over estimation in determining flooded extent area. Following the procedure, we determined an area of 239 sqKm flooded region in the image raster.

The corresponding 'ModelBuilder' has been included in the snap shot.