1135-K1-2703 **Celes A. Woodruff*** (woodruca@jmu.edu) and **Yonathan Admassu** (admassyx@jmu.edu).
Identifying Sinkholes in an Introductory Numerical Methods Course. Preliminary report.

High resolution digital elevation models (DEMs) have proven useful in mapping geomorphic features indicative of past geologic hazards, such as sinkholes. Sinkhole location mapping is necessary for studying factors controlling their development and also for city planning. Although sinkholes are easily discernible on high resolution DEMs by their rounded outlines, their large number has led to the investigation of automated mapping techniques to identify them.

Can the curvature of the boundary be used to determine whether a given depression is a sinkhole? We present a class activity and project for an introductory numerical methods course in which Calculus 1 and 2 are prerequisites. In the classroom we explore curvature of a function in the plane, radius of curvature, and osculating circles, then present a method for calculating curvature using discrete points. Outside of class, groups of students create codes in Matlab to calculate the curvature at each boundary point of some depression. Each group then decides how to use these individual curvatures to determine whether a depression is a sinkhole. Once all projects are complete the students present their methods in class and test their codes on actual geological data. (Received September 26, 2017)