

# LIDAR PROCESSING TO CREATE A PIT FILLED RASTER LAYER

Weber, Keith. GIS Director. Idaho State University GIS Training and Research Center.

Lidar technology can produce high-resolution models of ground elevation (e.g., 1-meter spatial resolution) with a vertical accuracy of +/-10 centimeters (0.1 meters) or better. All lidar project data processed by Idaho State University's GIS Training and Research Center (GIS TReC) will contain a bare earth raster layers created using 1-meter cell size (pixel size) and pyramids built using bilinear interpolation with LZW compression. Following development of the bare earth raster digital terrain model (DTM) the layer is pit-filled to remove any sinks (**Figure 1**). A sink or pit is a pixel with an undefined drainage direction and is frequently assigned a zero or negative elevation value. These pixels are very difficult to detect visually but easily identified by calculating a flow direction and flow accumulation model. Most standard bare earth layers contain pits. To correct for this error the GIS TReC has applied a workflow using the python pySheds algorithm based upon MatLab statistical processing. Applying the PySheds script is a necessary step to provide users with a high-quality DTM data.

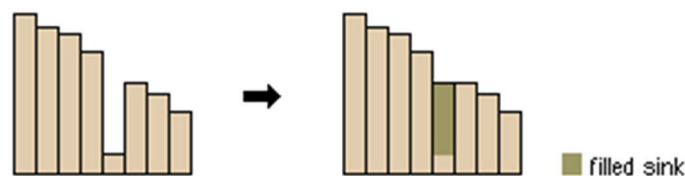


Figure 1. The pySheds script tool fills sinks (pits) in a bare earth digital terrain model (figure sourced pro.arcgis.com)

Each DTM zip file available from the GIS TReC's spatial library<sup>1</sup> contains two raster layers. One is a standard bare earth layer (be) and the second is a pit filled bare earth layer (bepf). All processed raster data are stored in TIFF file format with LZW compression and bilinear interpolation used throughout all processing. This protocol for processing bare earth lidar products at ISU GIS TReC ensures that only the highest quality (Q1 or Q2) DTM data are produced and made available for use.

## REFERENCES

Esri. (n.d.). How fill works. How Fill works-ArcGIS Pro | Documentation. Retrieved May 19, 2022, from <https://pro.arcgis.com/en/pro-app/2.8/tool-reference/spatial-analyst/how-fill-works.htm>

<sup>1</sup> [https://giscenter-sl.isu.edu/AOC/AOC\\_DEM/Idaho/LidarDTM/](https://giscenter-sl.isu.edu/AOC/AOC_DEM/Idaho/LidarDTM/)