DIGITAL MAPPING TECHNIQUES 2020

The following was presented at DMT‘20
(June 8 - 10, 2020 - A Virtual Event)

The contents of this document are provisional

See Presentations and Proceedings from the DMT Meetings (1997-2020)

http://ngmdb.usgs.gov/info/dmt/
Using 2-foot LiDAR DEMs for geologic mapping in Montgomery County, MD

Rebecca Kavage Adams, Maryland Geological Survey
Logan Hall, Eastern Shore Regional GIS Cooperative (ESRGC)

2013 4-foot cells → 2018 2-foot cells
What I want in a DEM for 1:24,000 (STATEMAP) mapping:

- Hillshade (or slope, shaded relief, TPI...) for visualization of topography
- Usable in field and office from 1:100,000 (county) – 1:2,000 (outcrop)
- In the field: on iPad (OFFLINE!) as tile package basemap in ESRI Collector
- In the office: in ArcMap for drawing contacts, faults, alluvium, etc
2013 LiDAR DEM hillshade at 1:24,000 (4-foot cells)

- Normal fault scarp, Triassic
- Terrace deposits from ancestral Potomac River
- Dissected shale barrens
- Triassic sandstone beds

Scale: 1 mile
Triassic sandstone beds

Degraded visualization, noisy

1:24,000  2013 4-foot cells

1:24,000  2018 2-foot cells

2 miles
Previously mapped ultramafic body

Old (chromite?) prospects

Improved alluvium

Previously mapped ultramafic body

500 ft
The problem:
I can’t use my new 2-foot LiDAR at all scales

- At 1:100,000-1:5,000: visualization of topography in a typical ArcMap hillshade (slope, etc) is degraded/noisy, *I can’t have this.*

- At 1:5,000-1:2,500: major improvement in detail, *I gotta have this.*
The solution:
MOSAIC datasets

- MD iMap online REST services of hillshade, slope, shaded relief from the 2-foot 2018 DEM, are great at all scales
- These are produced by Logan Hall at ESRGC for MDiMap
- Logan Hall says: he uses Mosaic raster datasets with functions applied
- Mosaics use **overviews** for downsampling NOT pyramids
- Total success! (you’ll see on next slide)
- *Why? Because overviews use .tifs?*
- I am able produce a tile package for offline field use on iPad
Normal fault scarp, Triassic sandstone beds

Dissected shale barrens

Terrace deposits from ancestral Potomac River

2018 LiDAR DEM hillshade (2-foot cells) at 1:24,000
Mosaic dataset with hillshade function applied