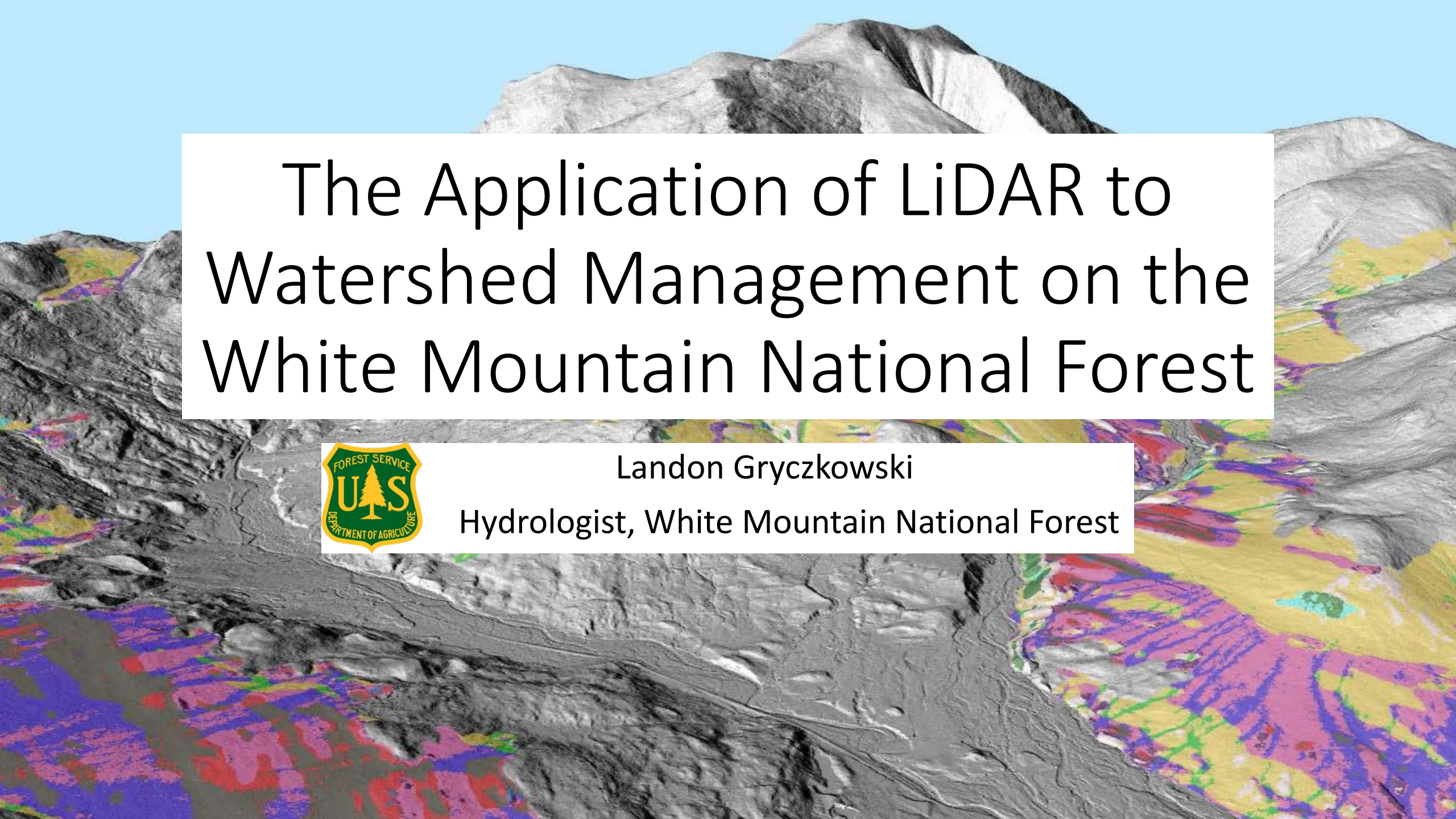


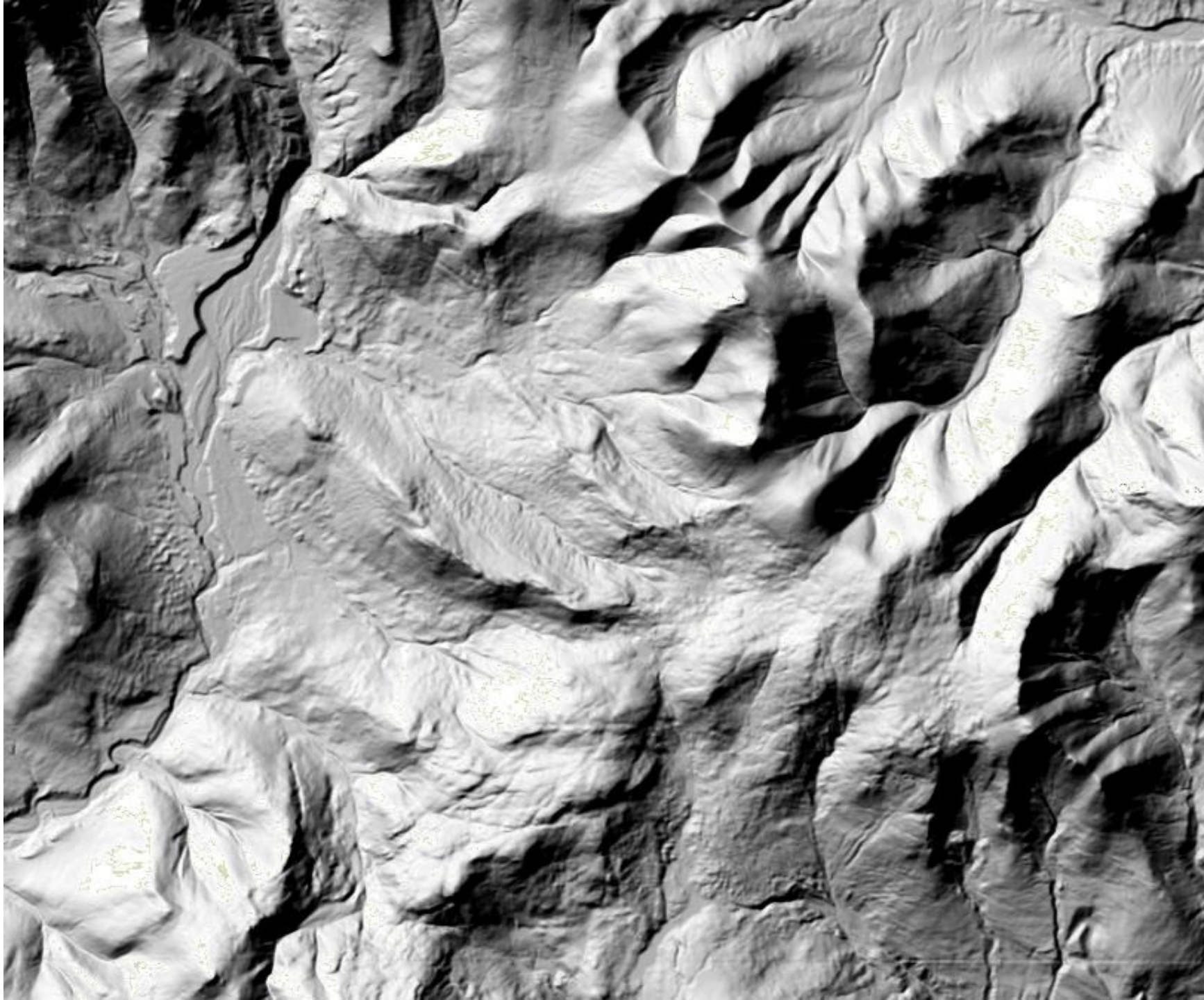
The Application of LiDAR to Watershed Management on the White Mountain National Forest

Landon Gryczkowski

Hydrologist, White Mountain National Forest

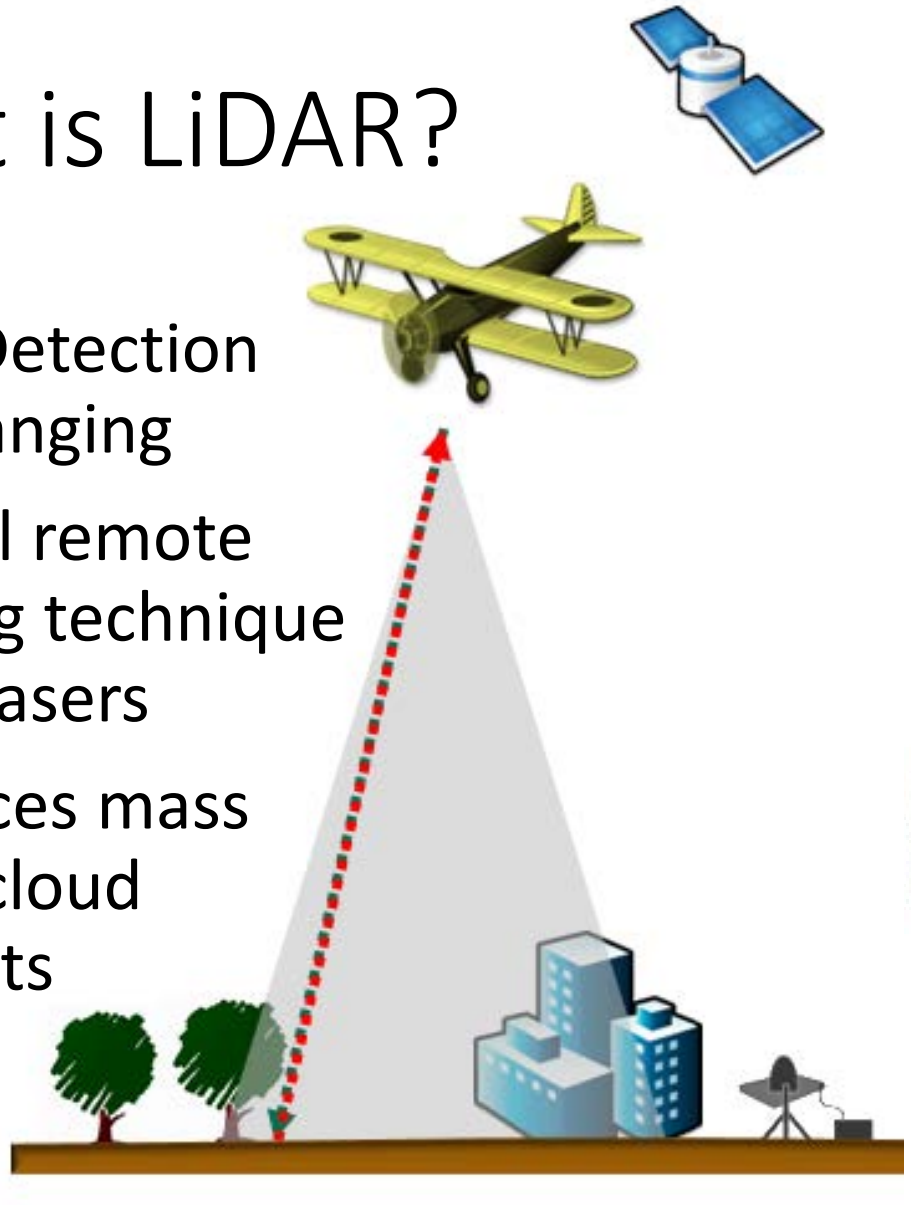
Overview

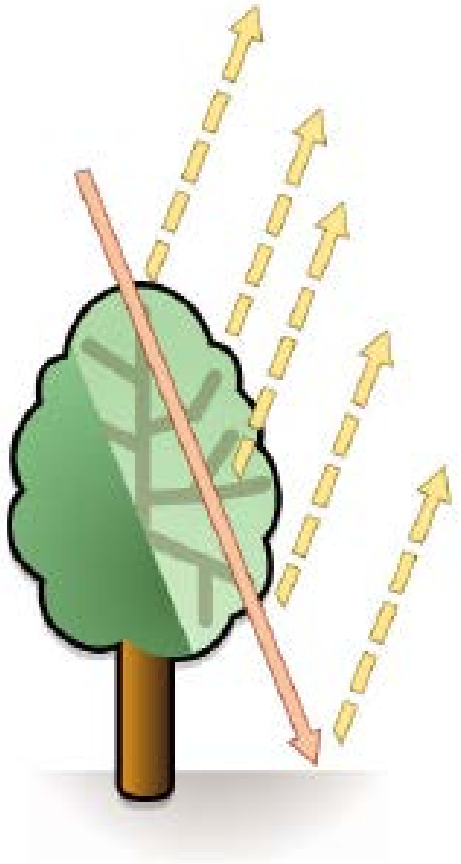
- What is LiDAR and why is it so cool?
- LiDAR status in NH
- Current applications
- Planned, near-future applications
- Future applications

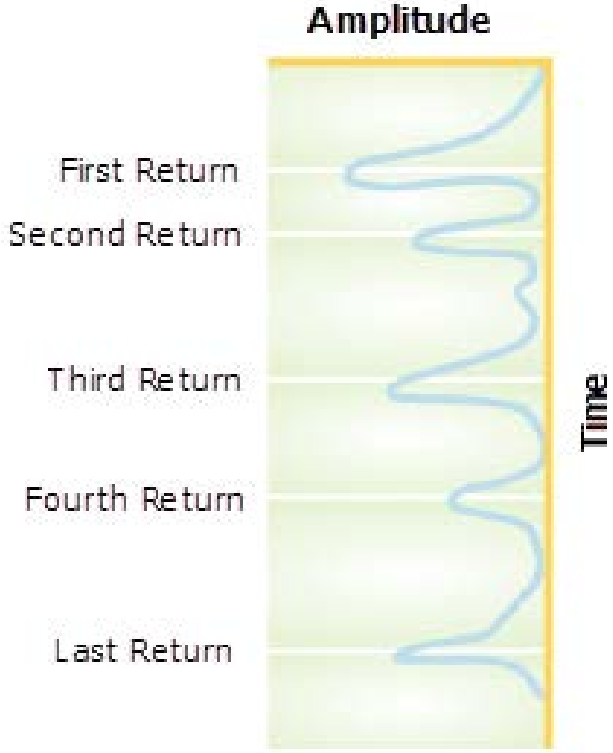


What is LiDAR?

- Light Detection and Ranging
- Optical remote sensing technique using lasers
- Produces mass point cloud datasets



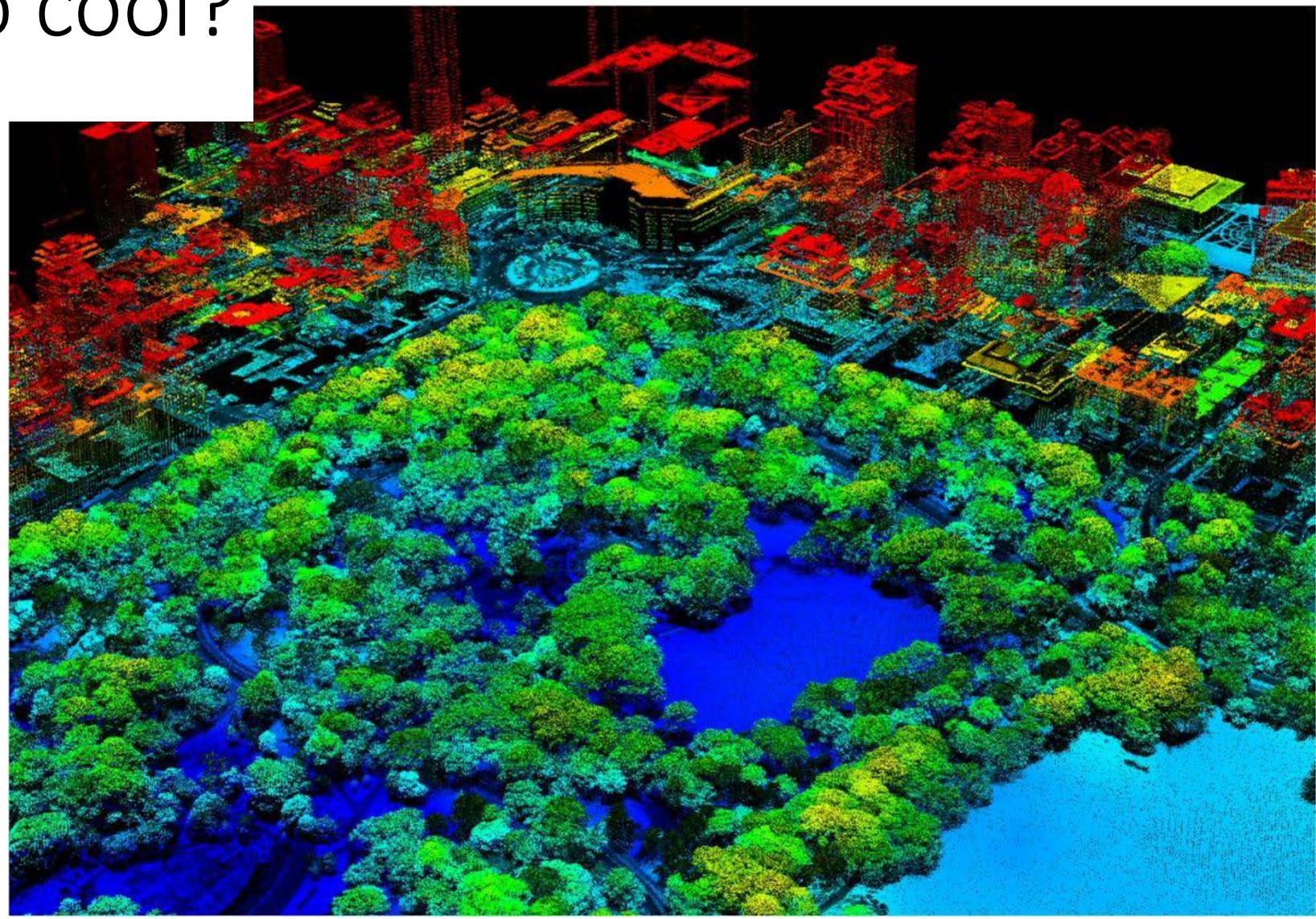




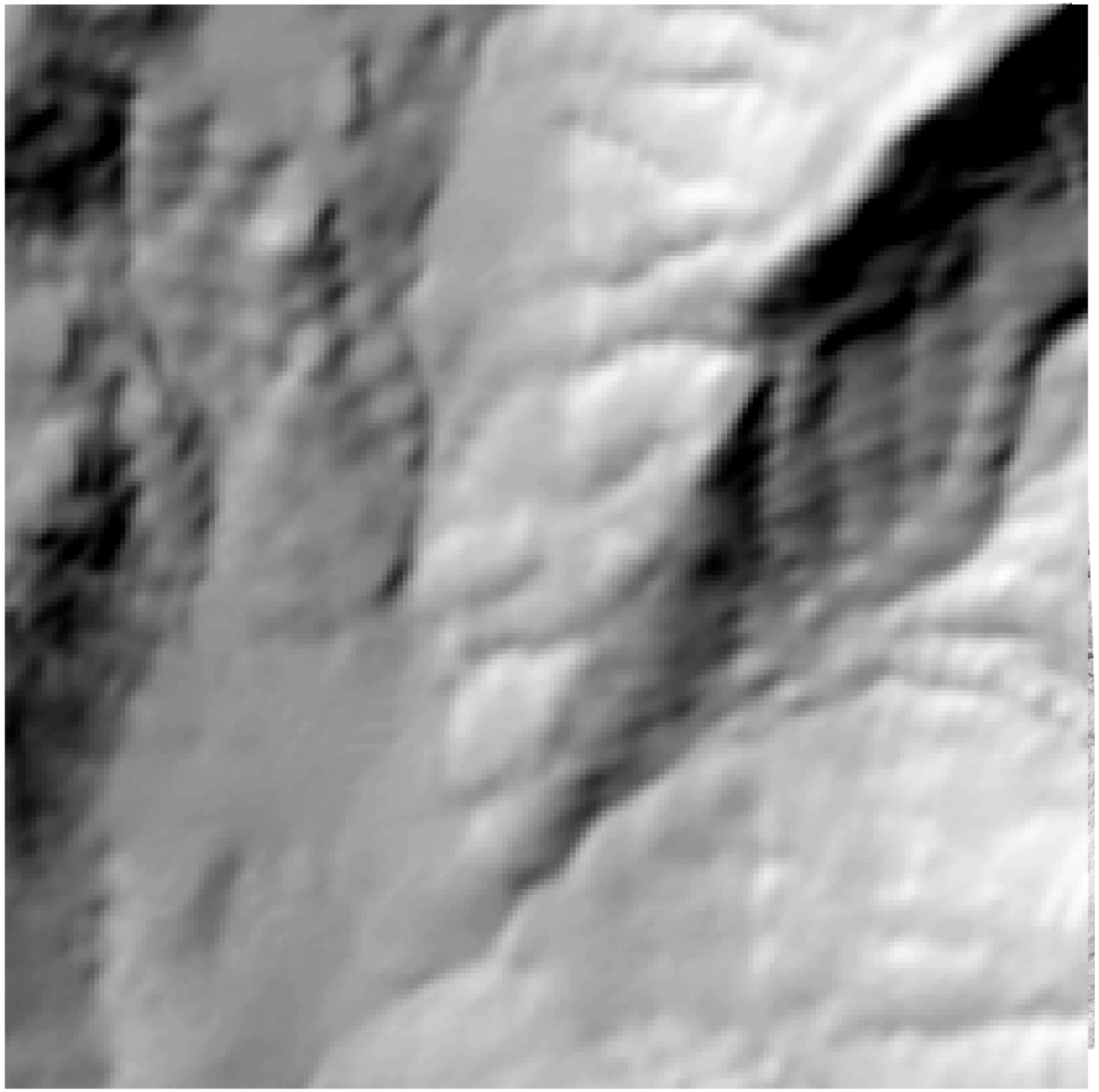
http://desktop.arcgis.com/en/arcmap/10.3/manage-data/las-dataset/what-is-lidar-data-.htm

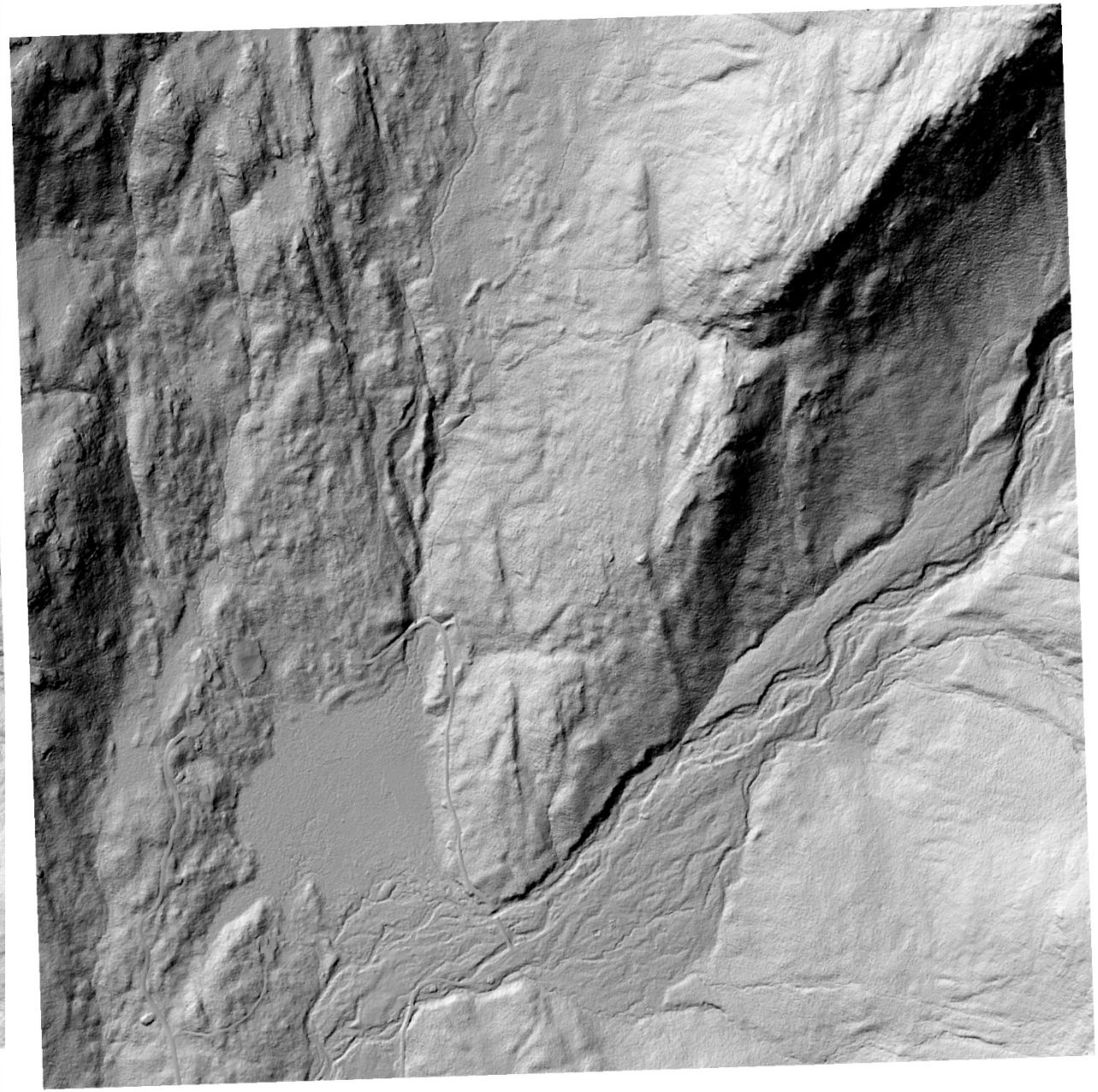
Why is LiDAR so cool?

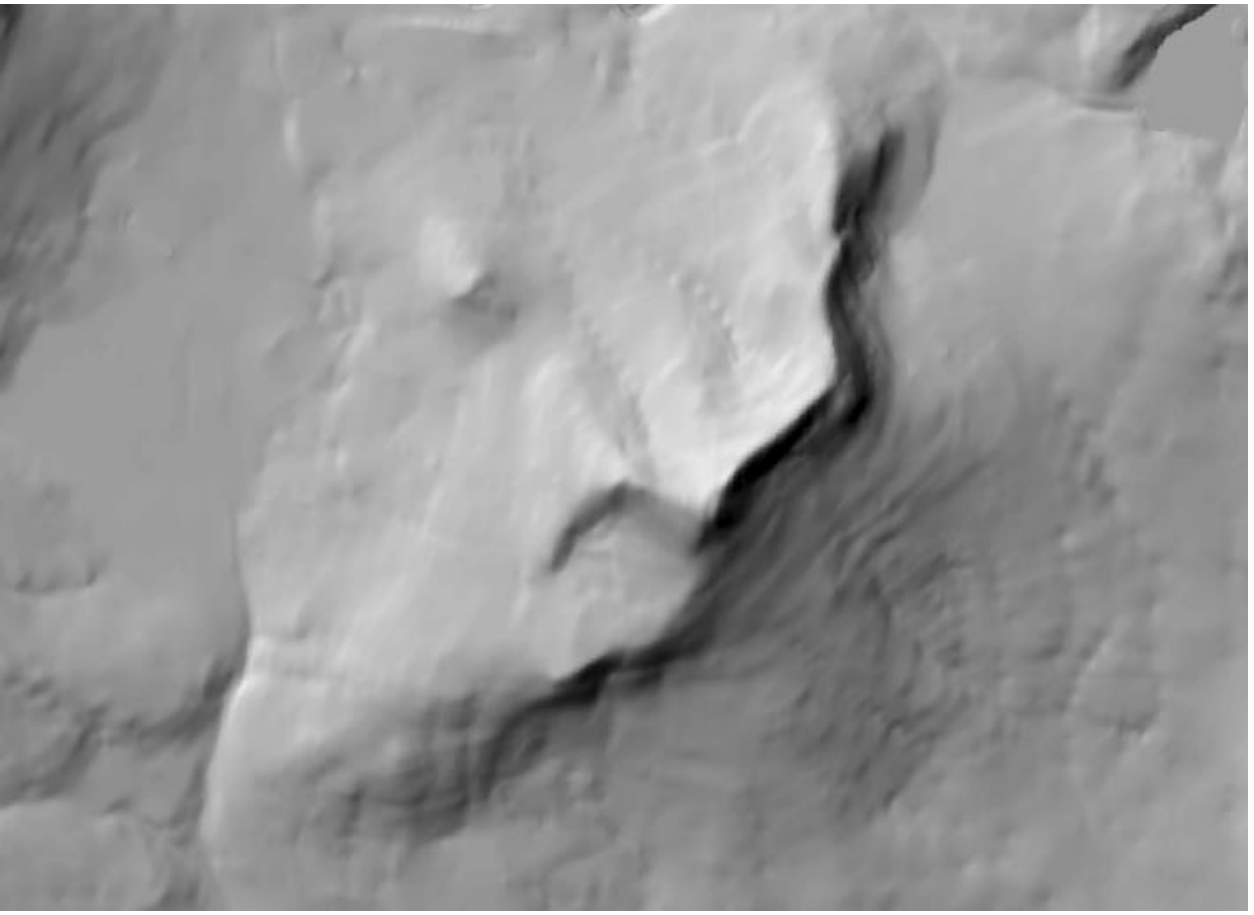
- Map top of tree canopy
- Map ground surface elevation
- Actual measurements of ground surface
- High resolution
- Repeated measurements

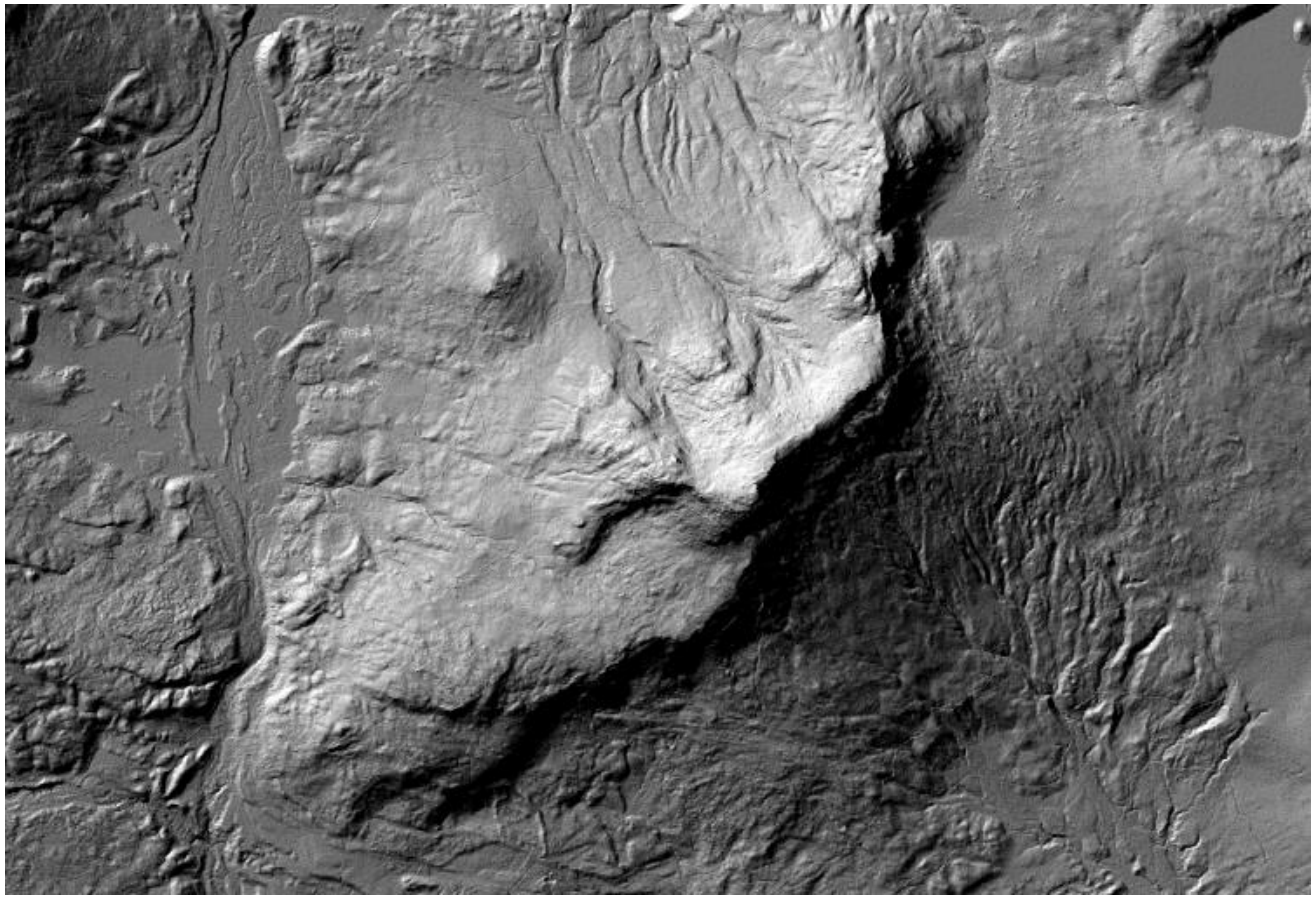


NYC point cloud. Credit: Jarlath O'Neil-Dunne; UVM-SAL



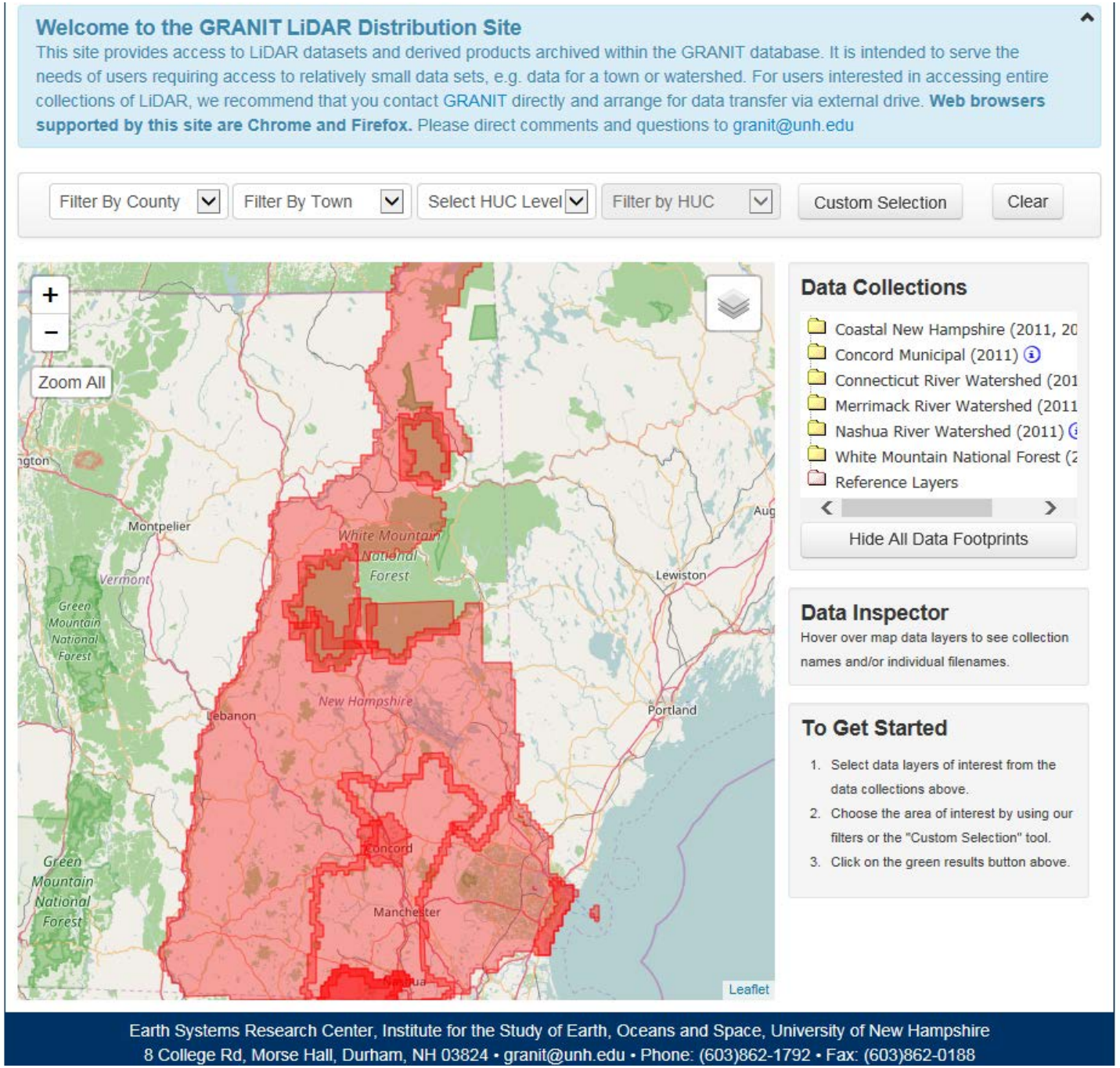






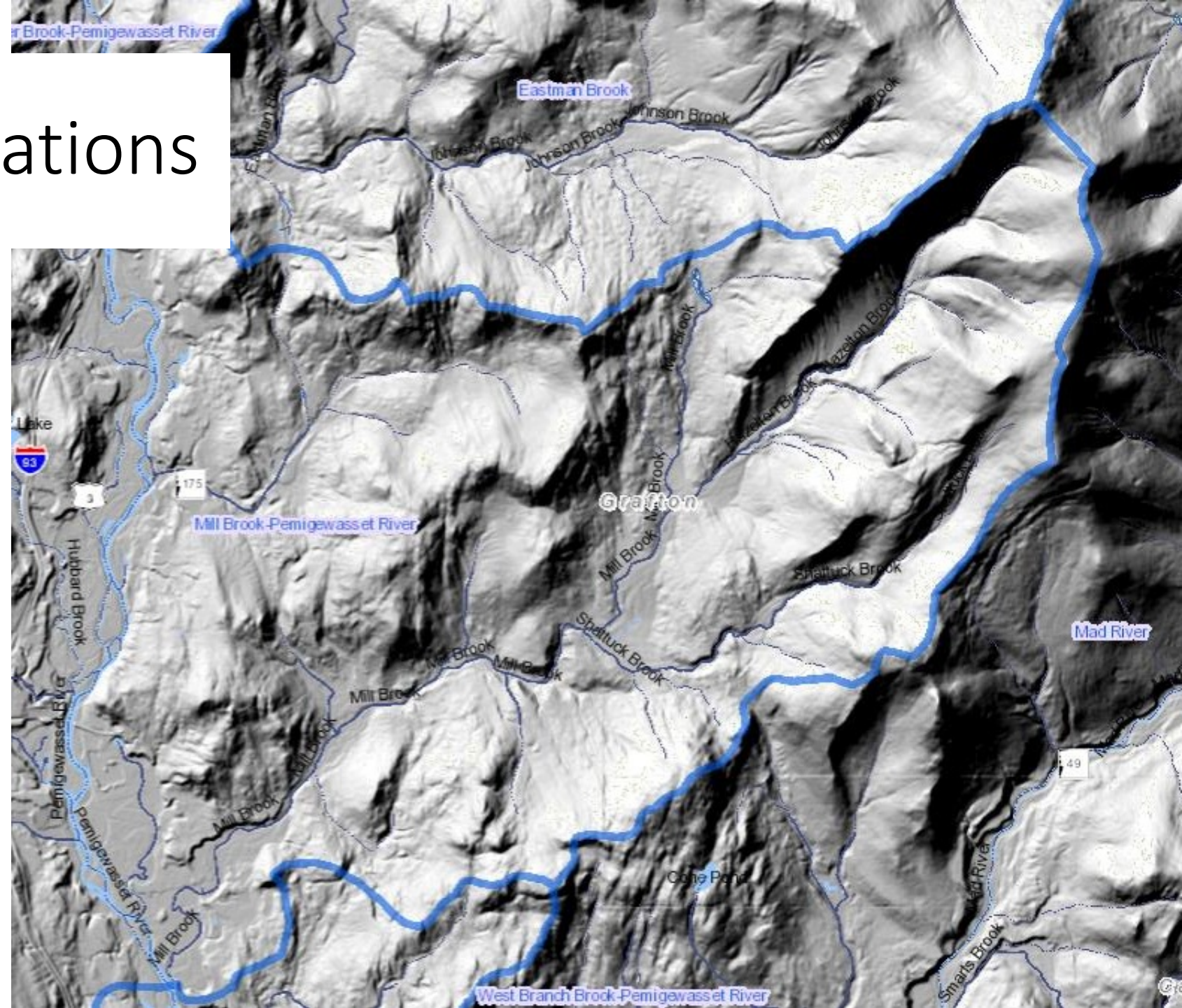
LiDAR Status in NH

- http://lidar.unh.edu/map/



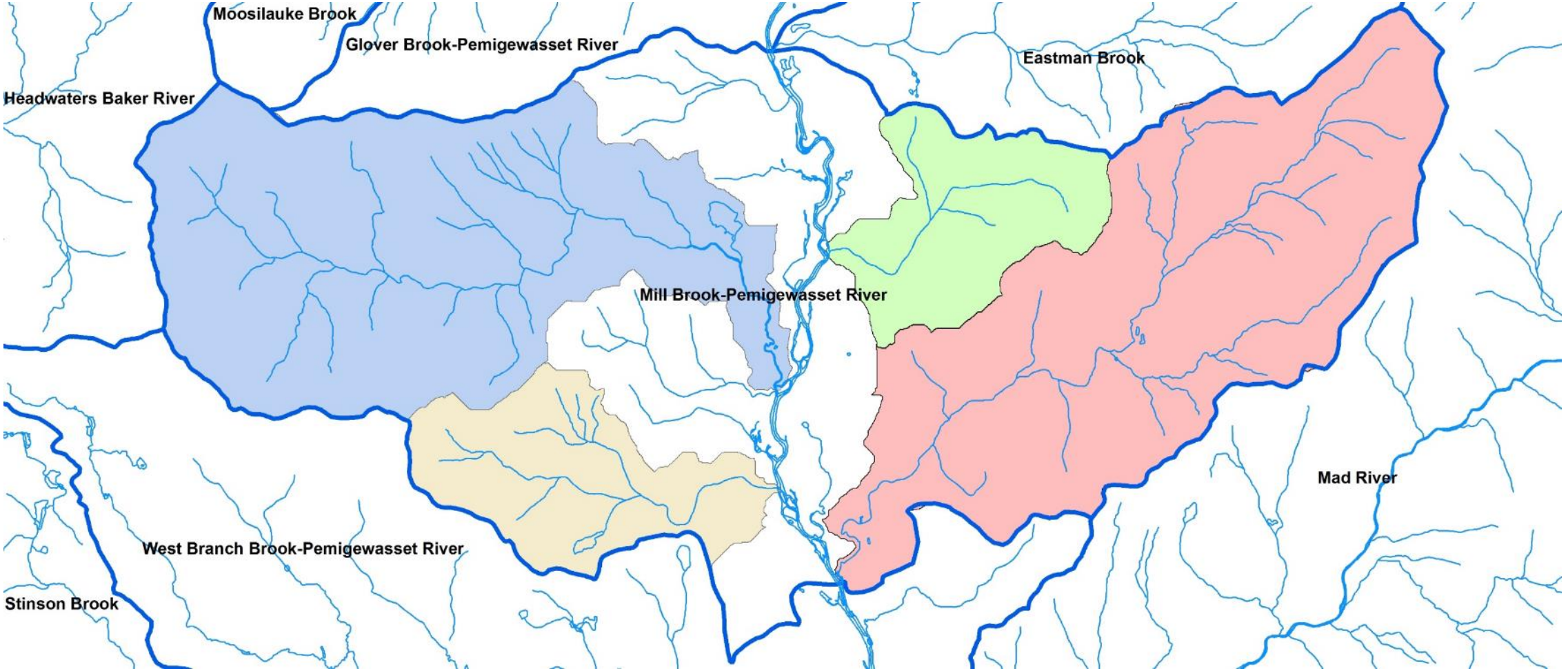
Current Applications

- Updating the Watershed Boundary Dataset (WBD)



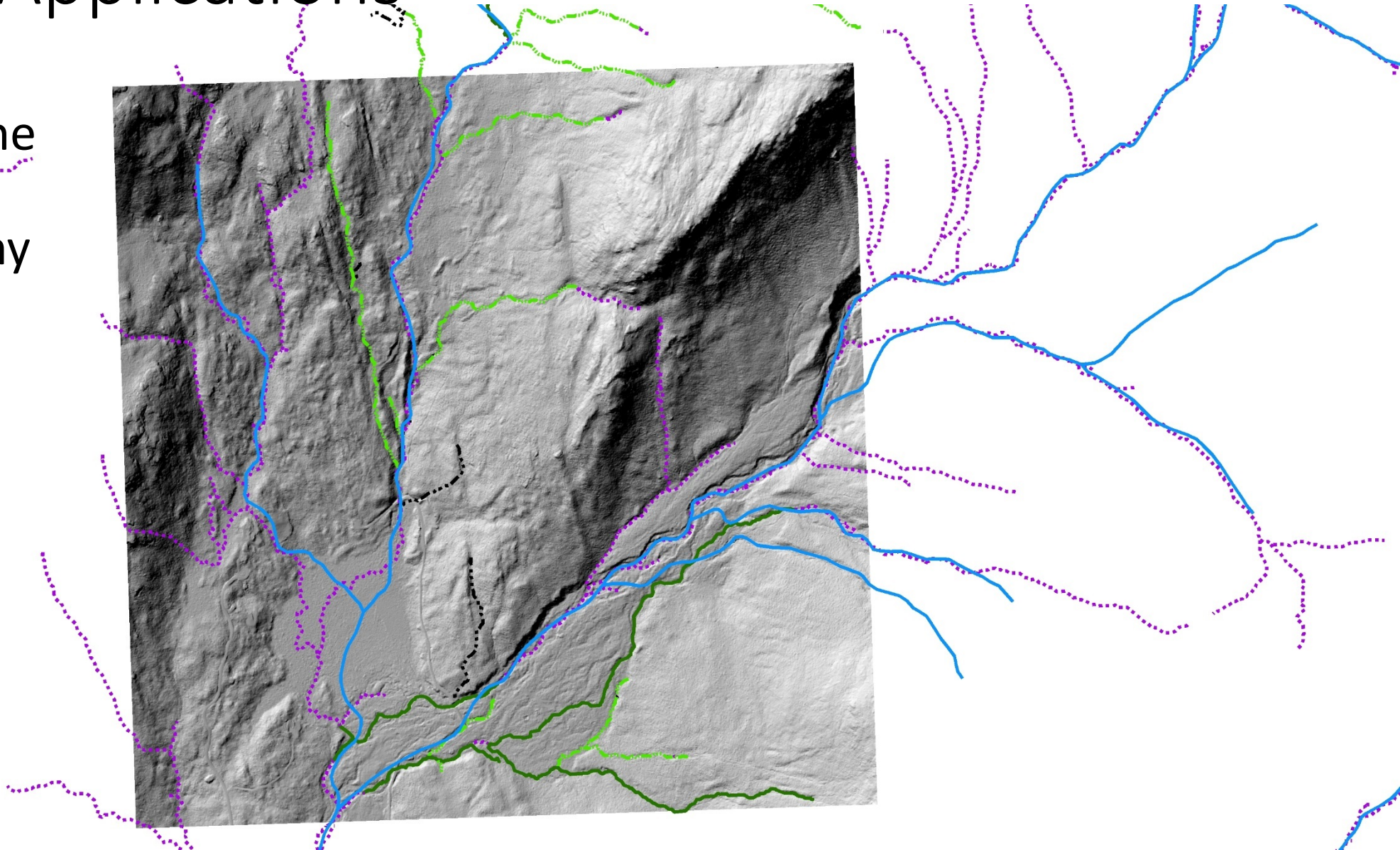
Current Applications

- Delineating HUC-14 and HUC-16 watersheds



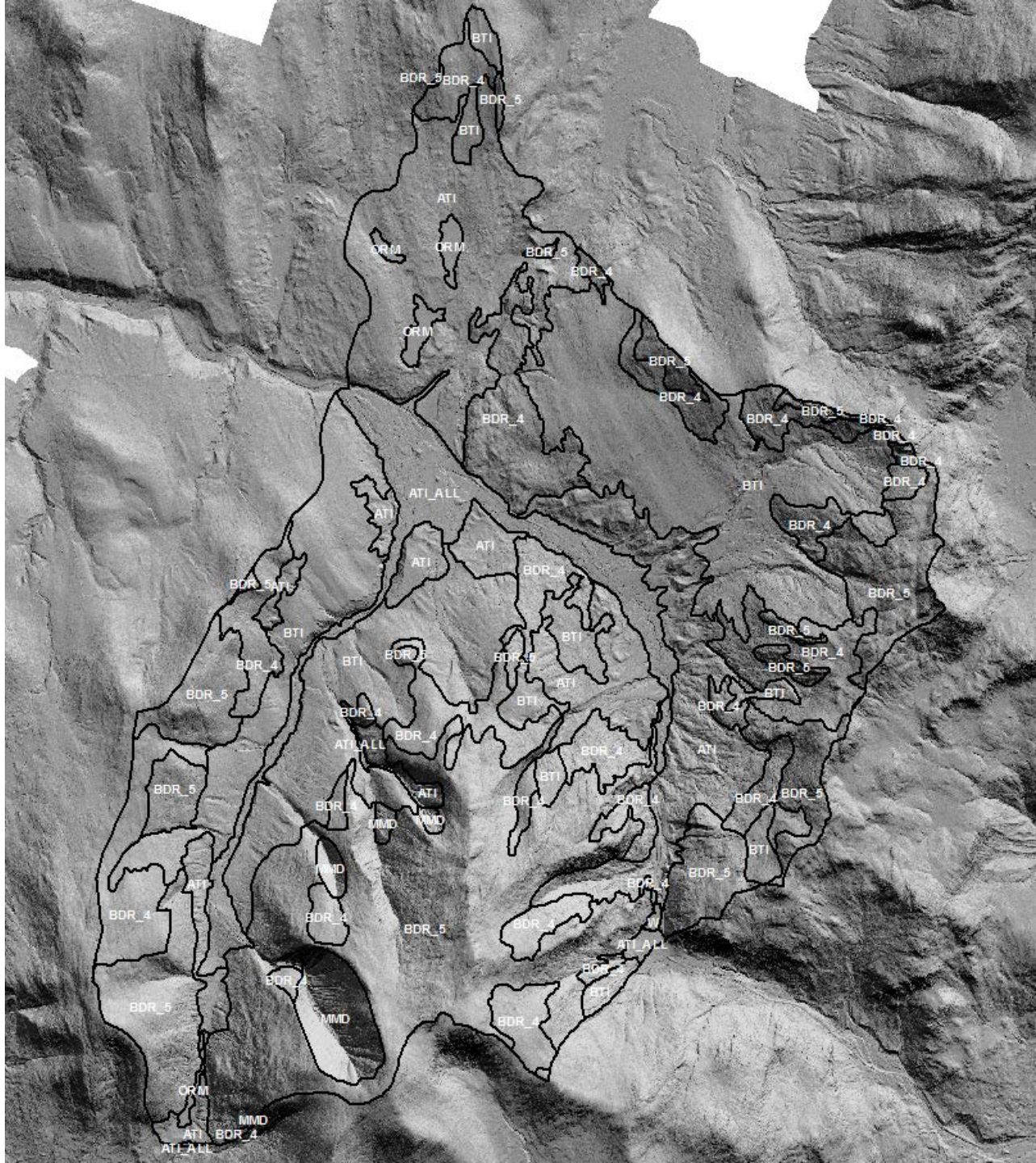
Current Applications

- Updating the National Hydrography Dataset (NHD) flowlines



Current Applications

- Forest-wide soil mapping and Terrestrial Ecological Unit (TEU) mapping



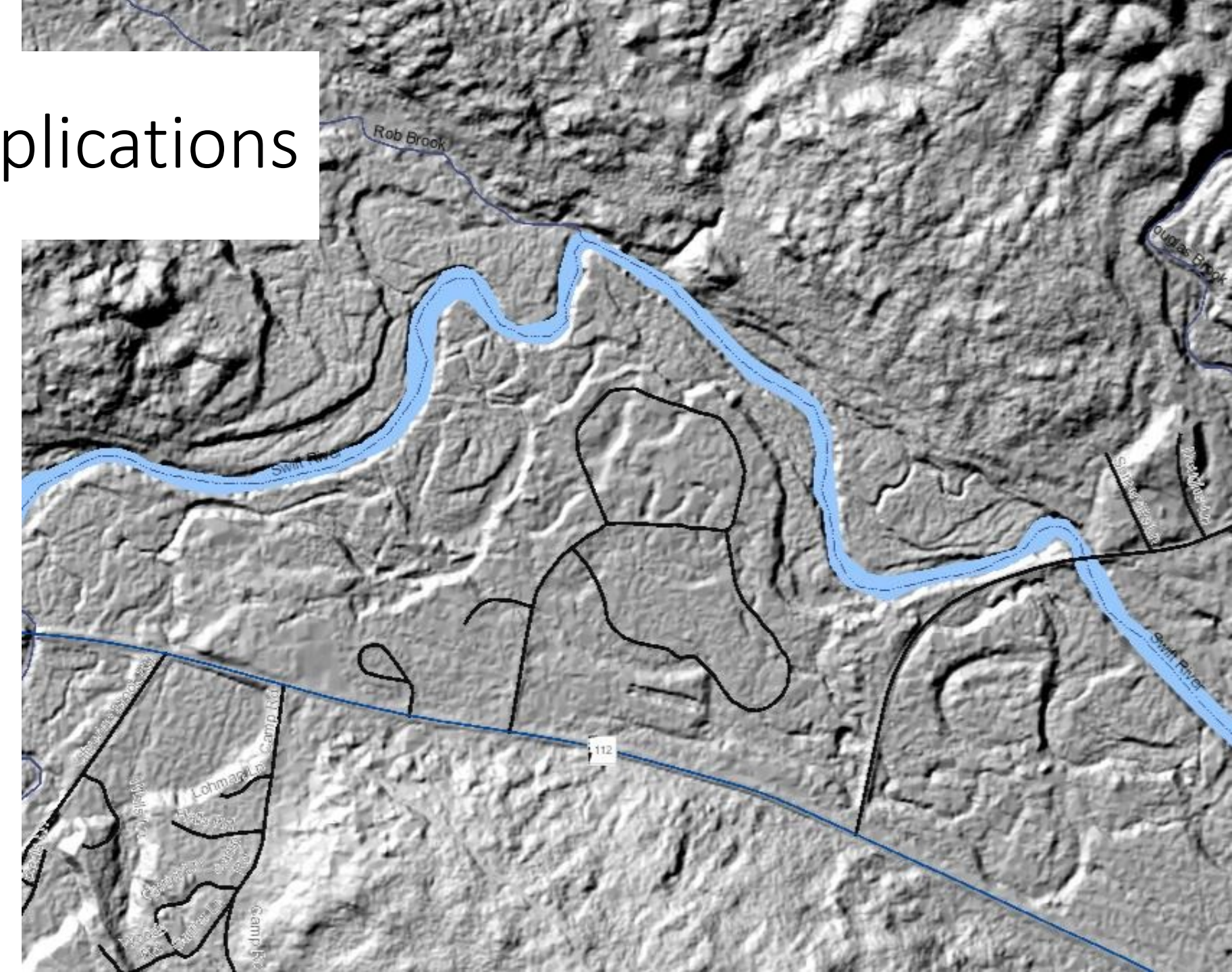
Planned Applications

- Mapping potential vernal pools

Photos: UNH Cooperative Extension

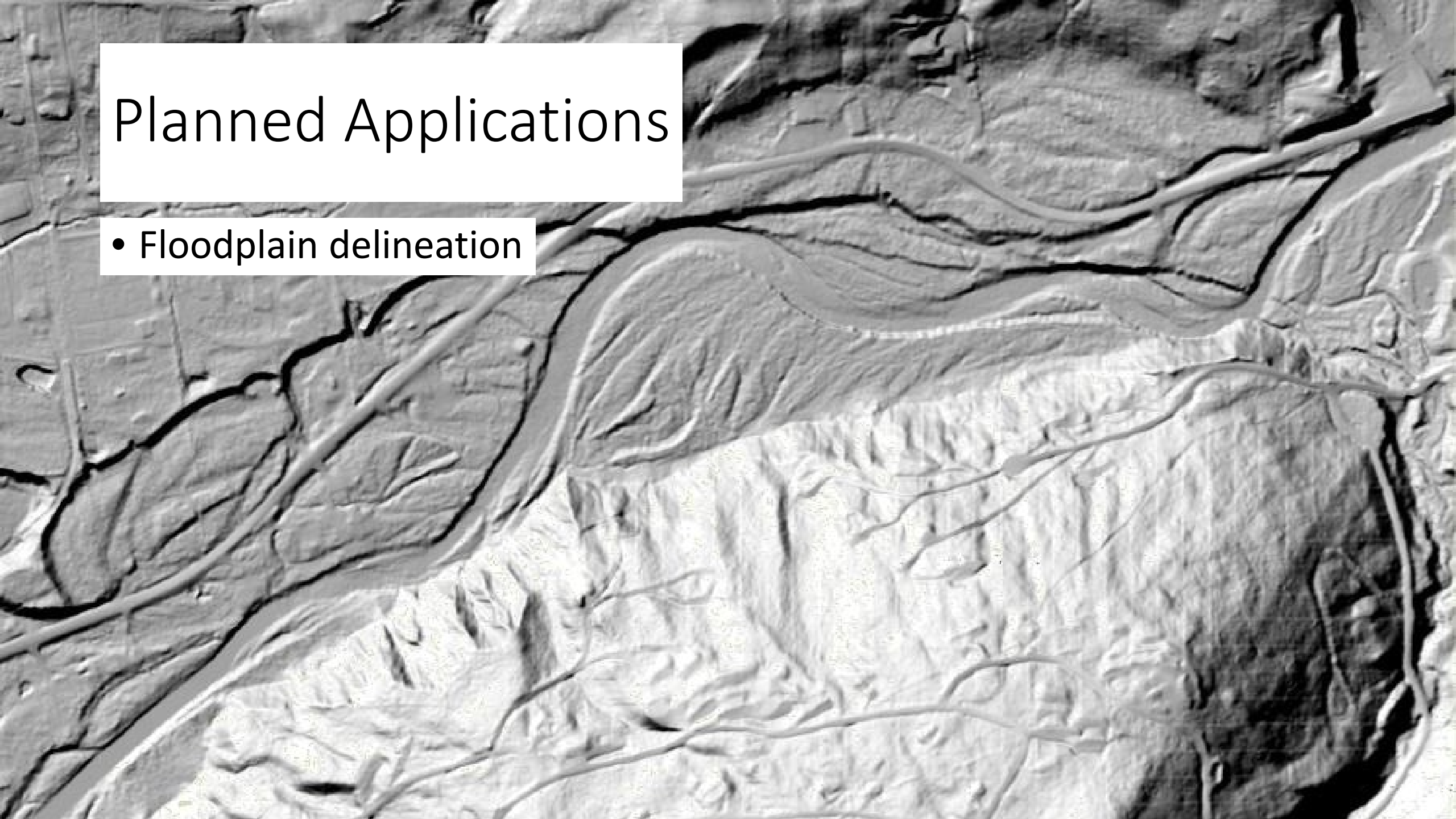
Planned Applications

- Flood hazard analysis at campgrounds near rivers



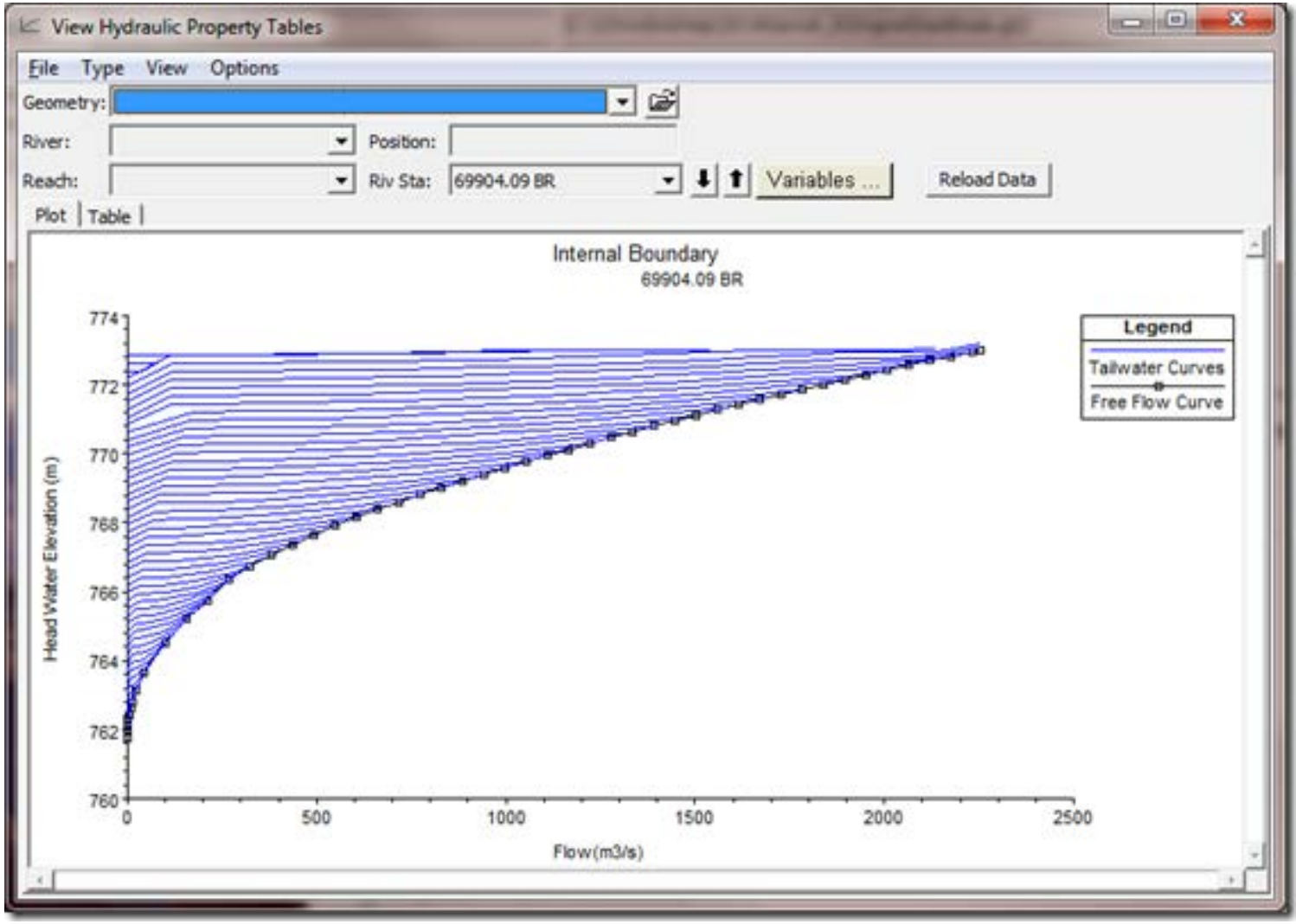
Planned Applications

- Floodplain delineation



Planned Applications

- Rating curve generation at new streamflow gaging stations



Credit: Christopher Goodell, WEST Consultants

Planned Applications

- Identifying straightened stream reaches

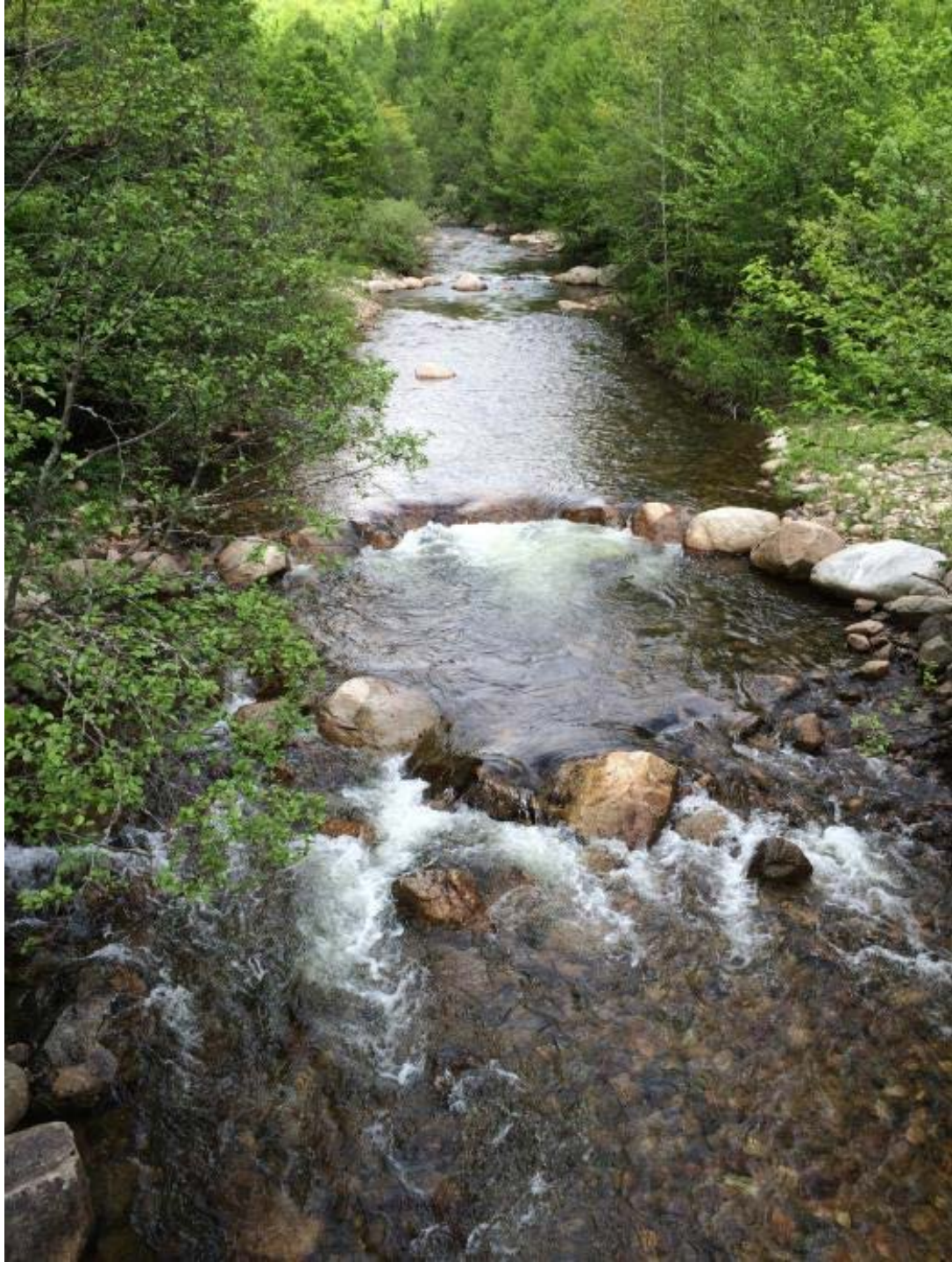
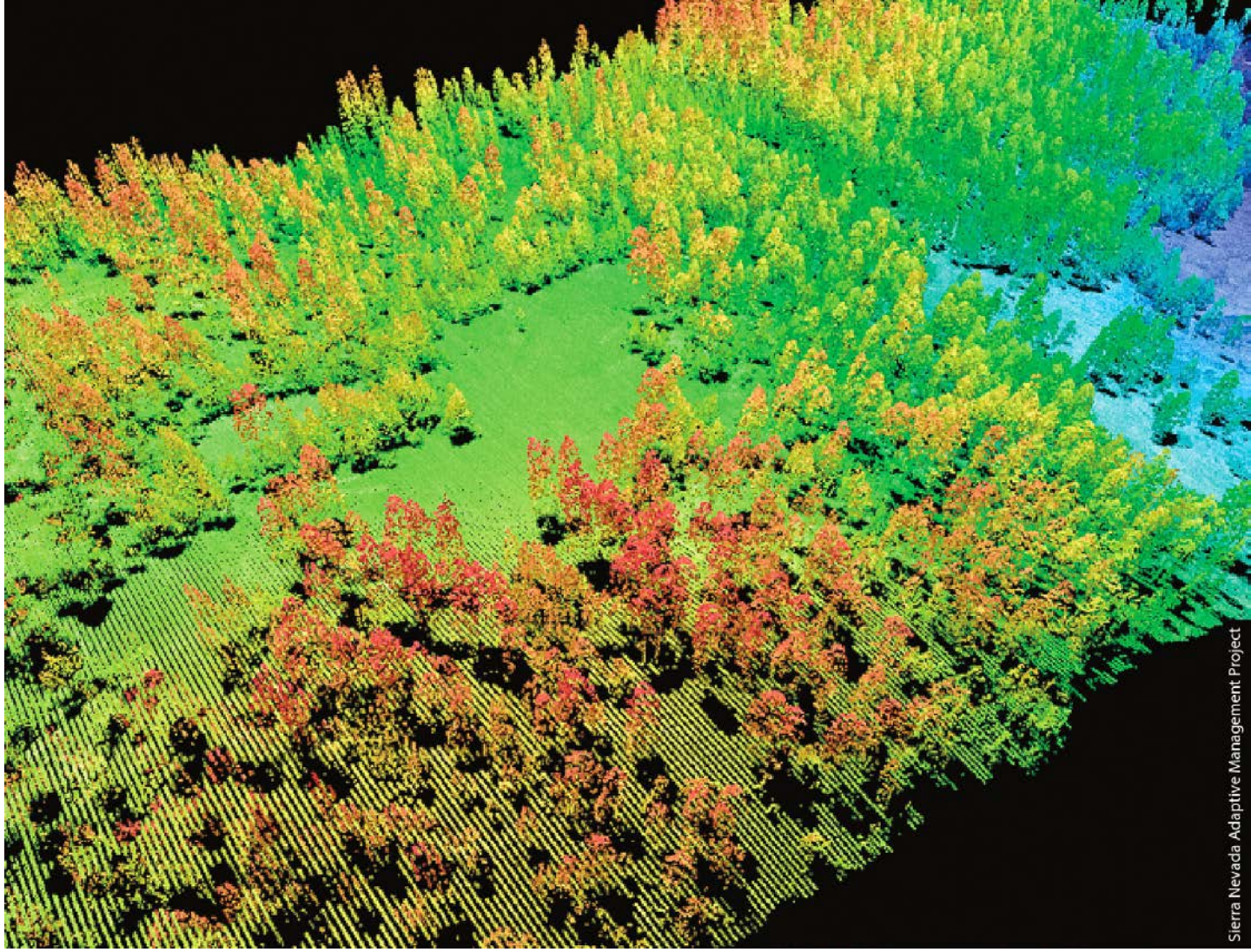


Photo: Nash Stream, Coos County, NH.
Credit: Trout Unlimited,
http://www.tu.org/tu-projects/nash-stream

Future Applications

- Stream and riparian characterization
- Advanced vegetation analysis
- Pair with multi- and/or hyper-spectral imagery to map to species
- Quantify landscape changes over time
- Disturbance mapping
- ???



Kelly M, Di Tommaso S. 2015. Mapping forests with Lidar provides flexible, accurate data with many uses. Calif Agr 69(1):14-20. DOI: 10.3733/ca.v069n01p14

Questions?

Photo credit: John Anderson, 2013 WMNF Artist-in-Residence Program