AIRBORNE LIDAR:

Remote sensing advances in forest inventory

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Gracie & Harrigan Consulting Foresters, Inc.

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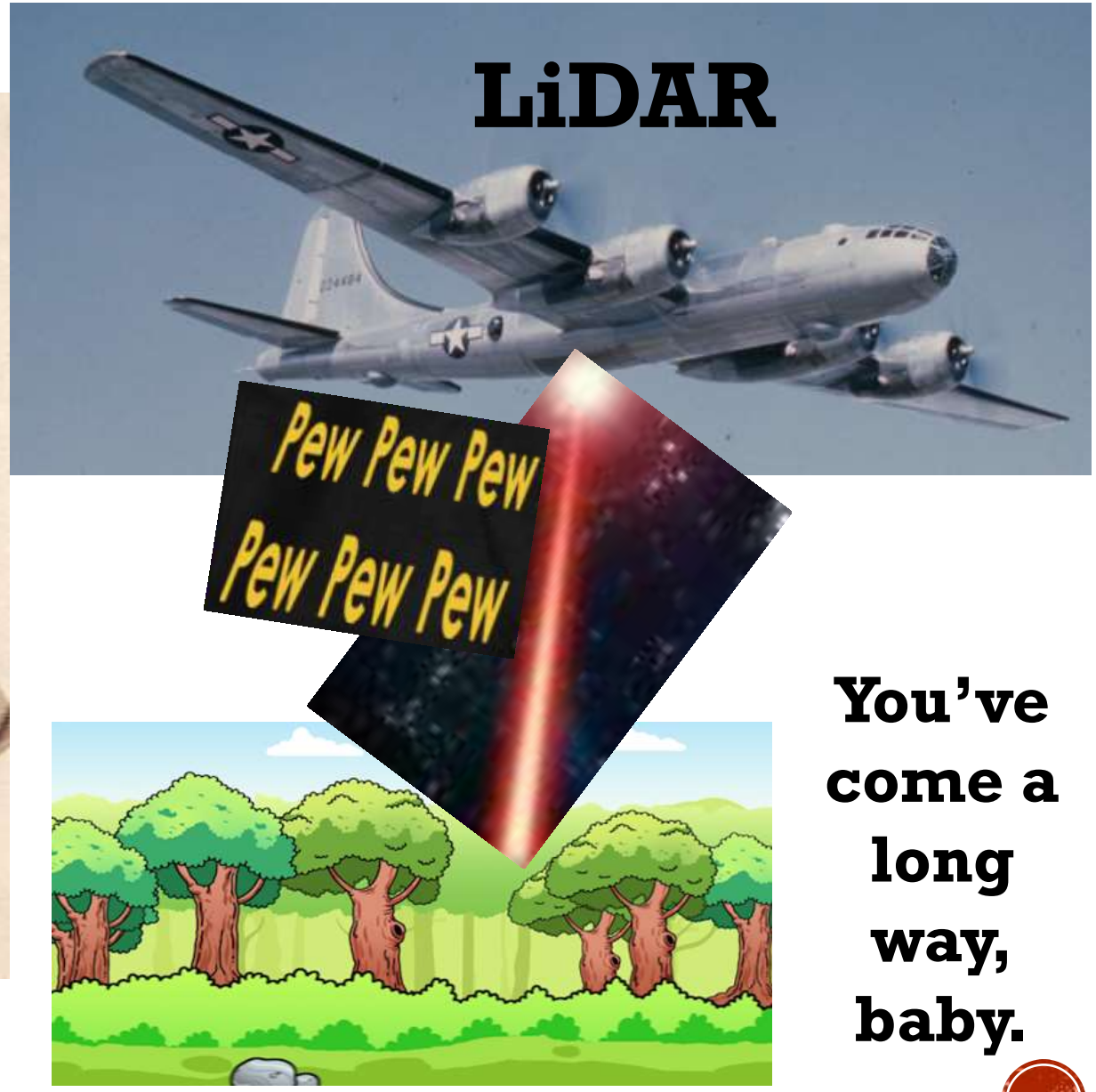
NJ Division of the Allegheny SAF annual training



You've come a long way, baby.

This slide is not drawn to scale

RURAL FORESTRY USES FOR STATE OF NJ LIDAR DATA IN 2020

- More accurate than aerial photography
  - Goodbye parallax!
  - Goodbye shadows!
  - Goodbye terrible contrast!
- Topographical information
  - Visually appealing
  - Set your own contour intervals
- Tree heights
  - Just to know
  - Site index
  - For use in stand delineation
- "False aerial photos"
  - To track changes on a property since the last set of aerial photos were published

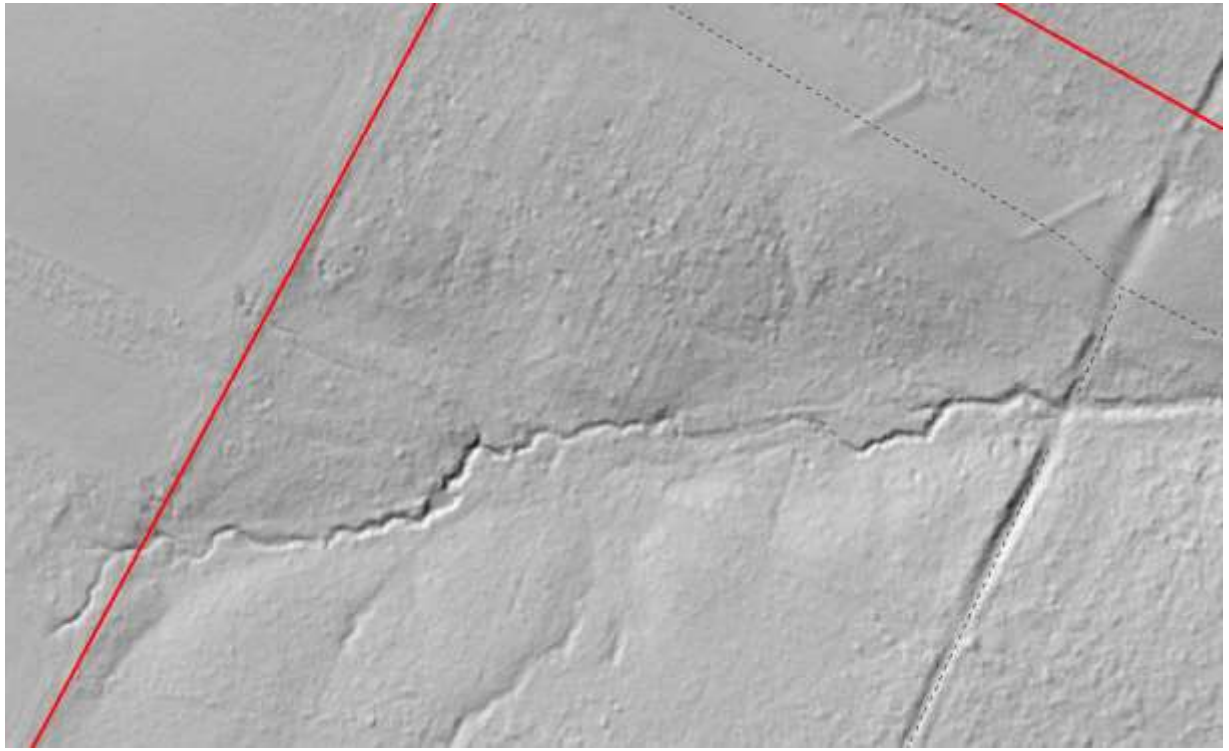
PARALLAX AND SHADOWS (W/ PARALLAX)

POOR CONTRAST

2015 aerial photography series

2012 aerial photography series

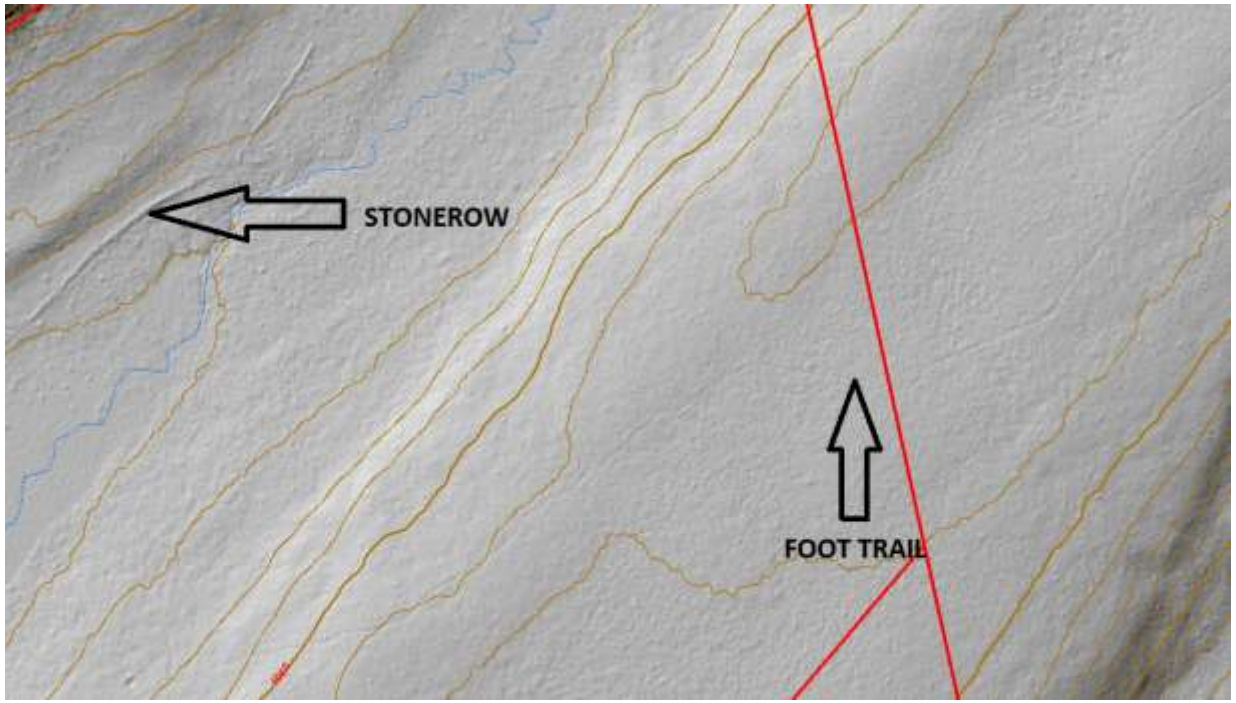
ANY PROBLEMS SEEING THE STREAM NOW?

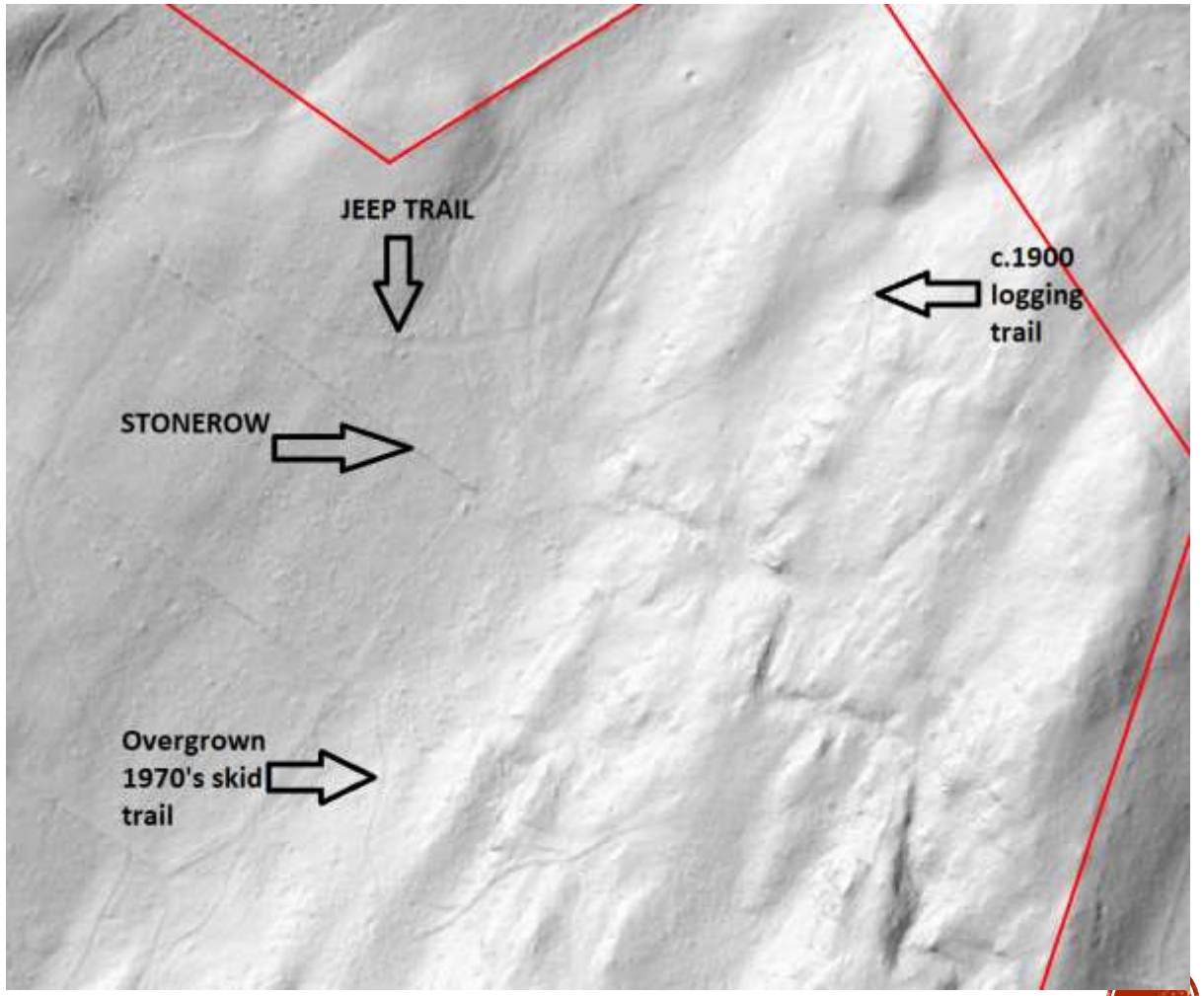


2018 LiDAR (Northwest NJ series)

- A "Hillshade" image is derived from those LiDAR points believed to have hit the ground (or water). Shadowing is simulated in order to visualize aspect and steepness.

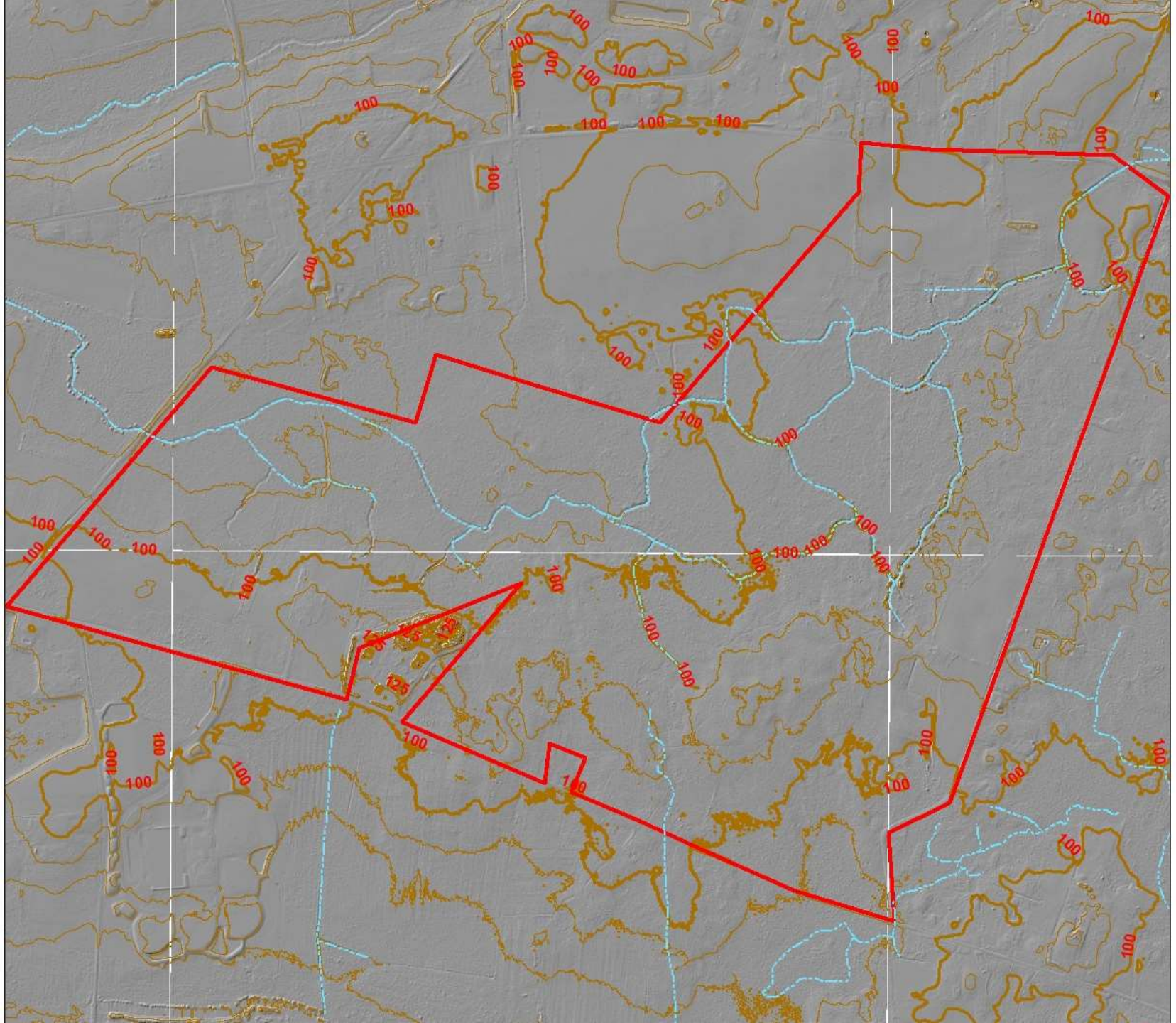
WHAT ELSE CAN YOU SEE?





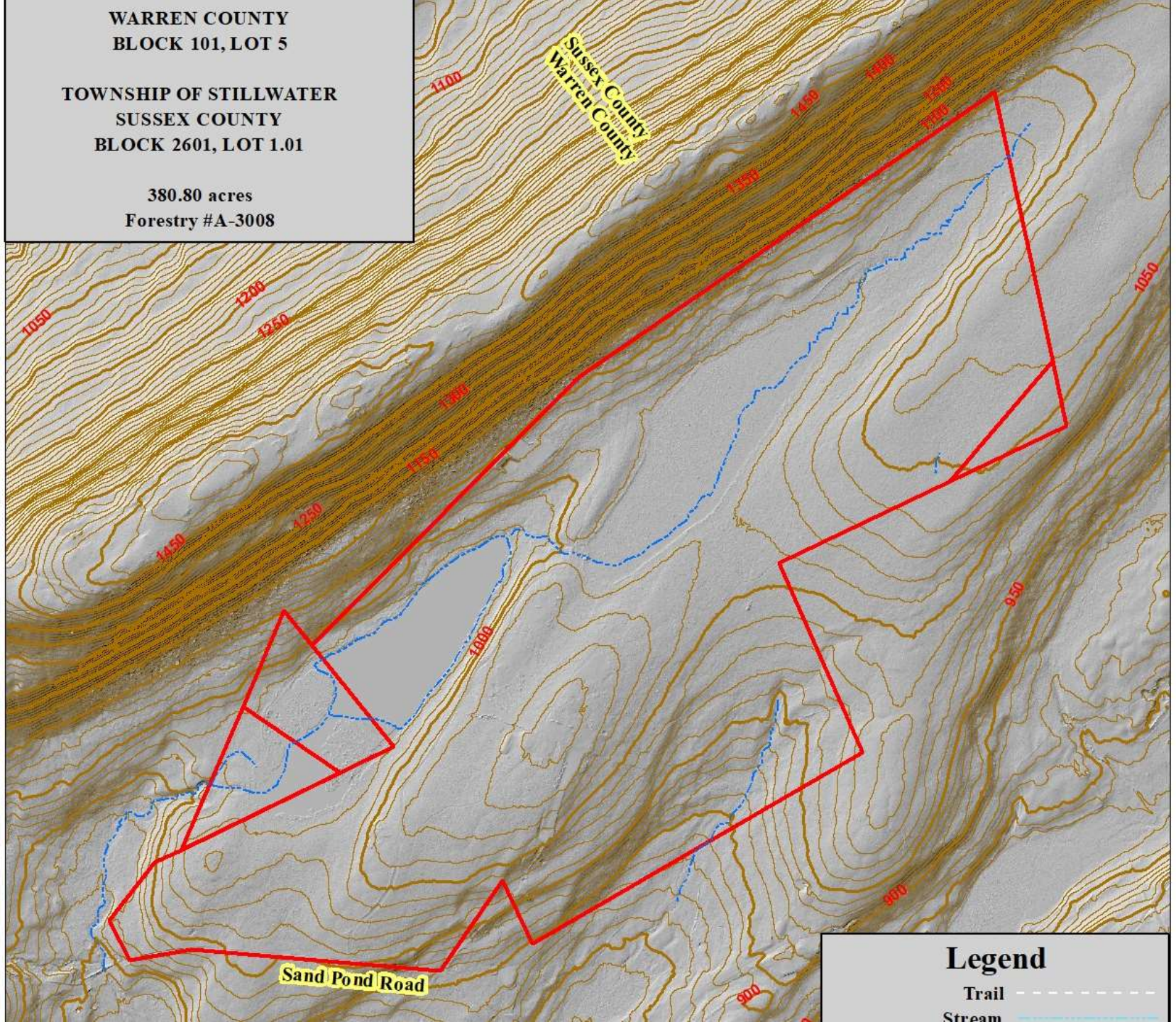
20-FT CONTOURS ON USGS QUADRANGLES NOT DOING IT FOR YOU?

The property shown is over 450 acres!



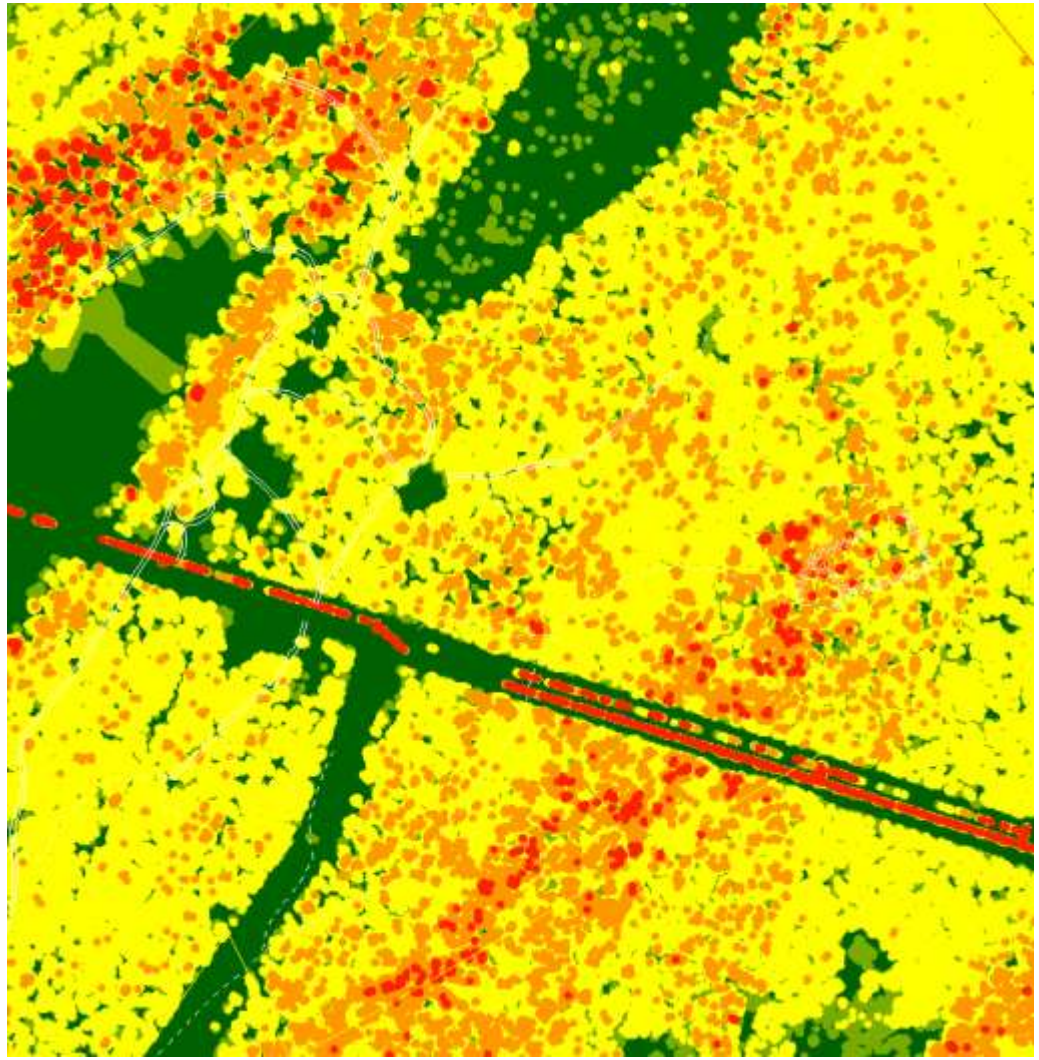
Change your contour intervals to what works for you

5-foot contours shown. You could probably get down to 2-foot intervals for very flat properties.



HERE'S A MAP THAT'S LESS NOISY

10-foot contours in northern Warren County



TREE HEIGHTS

RED is > 95 feet tall

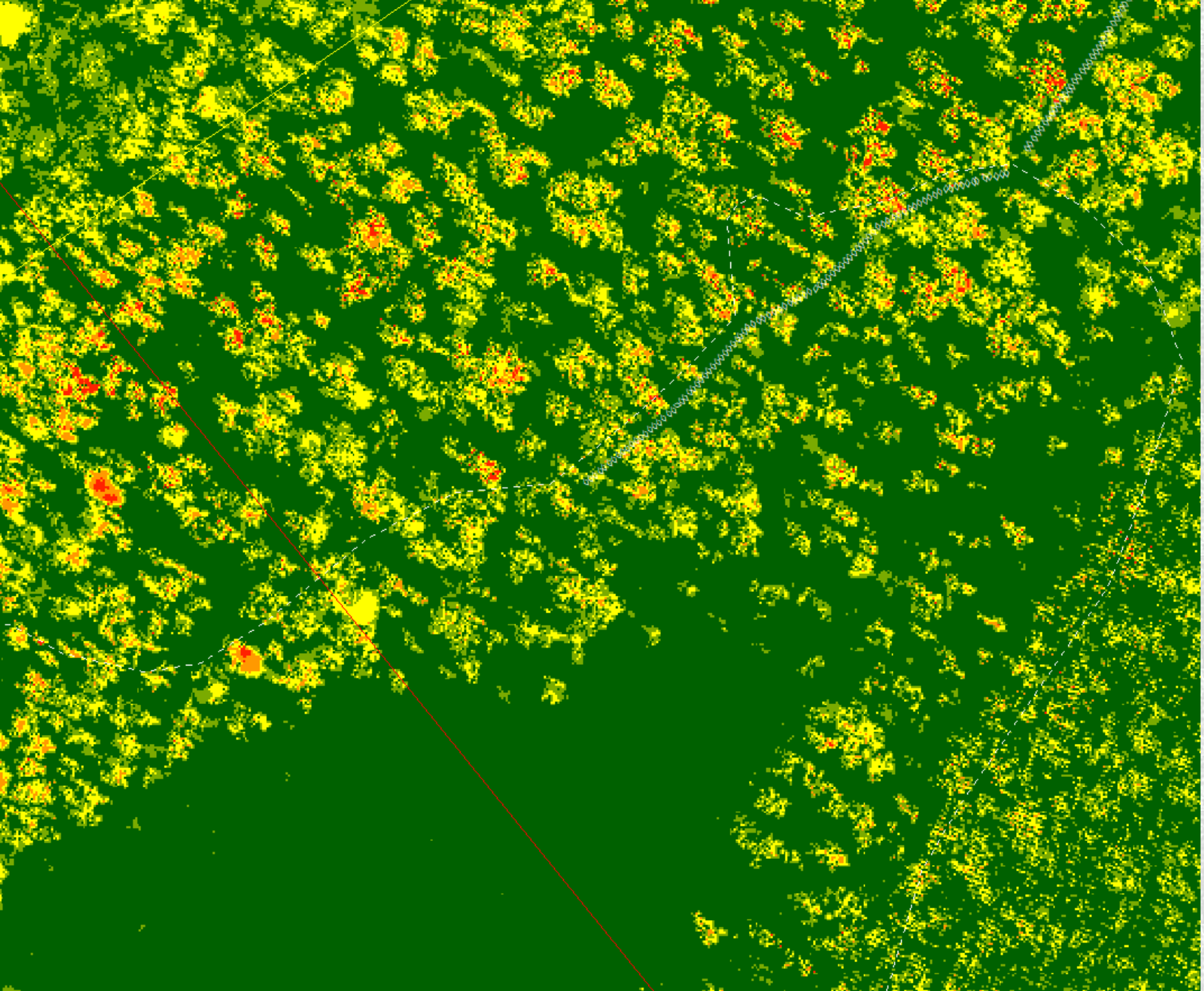
ORANGE is between 95’ and 75’

YELLOW is between 75’ and 40’

LIGHT GREEN is between 40’ and 10’

DARK GREEN < 10 feet tall

Each dot represents a high point in the canopy. Click on a dot to find the height.



TREE HEIGHTS

…or don't highlight the maximums so you can visualize canopy gaps and crown widths.

"FALSE AERIAL PHOTOGRAPHS" (NW NJ ONLY)

2015 aerial photography

2018 LiDAR NW NJ series

"FALSE AERIAL PHOTOS" FROM LIDAR

- Made by combining "intensity" data, along with canopy-level LiDAR
- Just for internal use
- Poor presentation quality due to overlapping flight paths
- You might be able to tease some information regarding understory and midstory, but probably not

OTHER USES FOR TODAY'S NJ LIDAR DATA

- Recreation
  - High-accuracy trail maps / contour maps
  - Orienteering maps
- Historic
  - Locate old structures and foundations in the woods
  - Locate old roads
- Urban forestry
  - Locating individual trees
  - Tree heights
  - Crown widths
  - Possibly live crown heights

PROBLEMS

- Cost of software
- In order to process LiDAR data, you need GIS software. ArcGIS with the Spatial Analyst extension costs ~$5,000 for a single computer.
- Is there cheaper software? Yes. But that does not come with support. If you don't have formal training in GIS, you need support. Trust me.
- If you dig hard, you can find hillshades you can view through your web browser, but everything shown needed to be processed.
- Hard drive space. LiDAR data is YUGE! You will need 1-2TB to work with, and several more TB of external hard drive space for "deep storage."

WHERE IS LIDAR GOING? (SPECULATION)

- In New Jersey, we're in the second wave of airborne LiDAR. The first wave was nothing to write home about.
- The 1995 statewide aerial photo series was nothing to write home about either…
- Aerial photos only got better from there. So will LiDAR data.
- Expect higher-density LiDAR in the future (more "pew pew pew" per acre), with an eye towards being able to gather understory and midstory coverage/closure from the air
- Expect "intensity" to be standardized at some point in the future. There is some anecdotal evidence that certain invasive plants reflect LiDAR at a different intensity than native plants.

QUESTIONS?

Thank you!

-Steve Kallesser, CF

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