

# Laser imaging helps UNH researchers see forest

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University of New Hampshire researchers are looking at data from laser imaging of forests with the goal of helping foresters and landowners track tree inventories to save them from the time-consuming practice of heading into the woods with tape measures.

Mark Ducey of the New Hampshire Agricultural Experiment Station has been investigating how aerial and ground light detection and ranging—better known as LiDAR—can be used to provide more accurate and detailed information about forests. The technology maps three-dimensional land surface elevations.

Data from such projects as aerial mapping of New Hampshire, which is being done as part of a national effort announced in 2014 by the Obama administration, can be used to see what's in the forests.

"You can spot things like old cellar holes, stone walls and wagon roads from when an area used to be a field," Ducey said. "Just being able to spot old cellar holes, which are hazards, is helpful."

With aerial LiDAR, a plane flying over the land directs a rapidly pulsing laser toward the ground. The laser sweeps back and forth, collecting data to complete coverage. A detector measures how long it takes for each beam of light to travel to the ground and reflect back to the plane. Travel time is converted to distance based on the speed of light, resulting in numerous closely spaced ground elevation data points.

Ducey and his research team have partnered with the U.S. Forest Service and National Resource Conservation Service to work on projects in the White Mountain National Forest to see how LiDAR can help map rare plant communities, wildlife, soils and timber management. They found an old homestead with a well that would be big enough for someone to fall into.

Ducey says the technology could save time on routine tasks such as taking timber inventories with tape measures in a state where forests cover 84 percent of the land. The hope is to use the data to help a small landowner.

"The old-fashioned way of doing this is really labor-intensive and probably not affordable in the long run for the U.S. Forest Service," Ducey said. "The airborne LiDAR maps land forms and provide an initial guess of what we might find on the land. The role of the field work is then to verify what is there rather than starting from a blank sheet of paper," he said.

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