Development of LiDAR-Based Data Products for Oklahoma

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Brief Overview of LiDAR
(Light Detection and Ranging)

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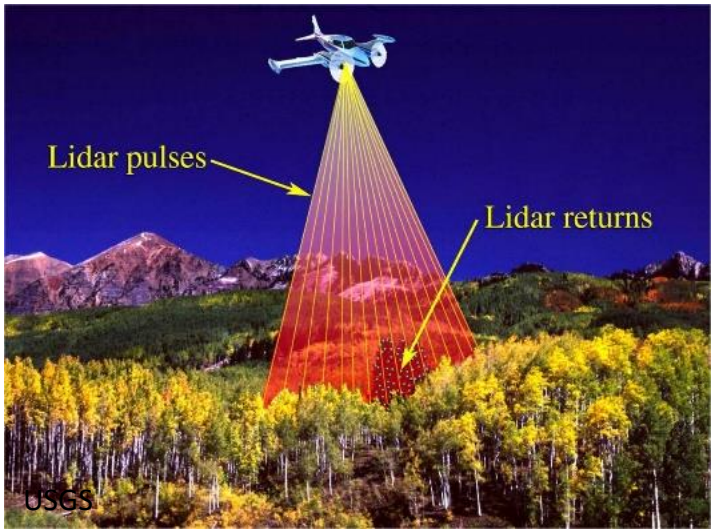

*Ground and Drone-based Units Also Exist

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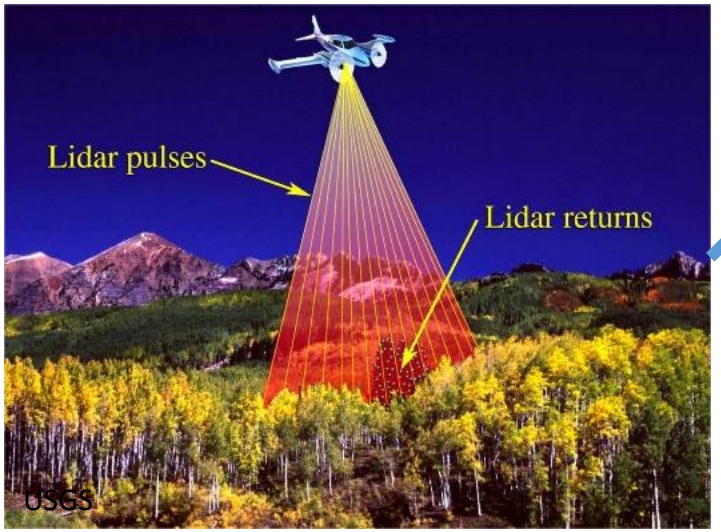

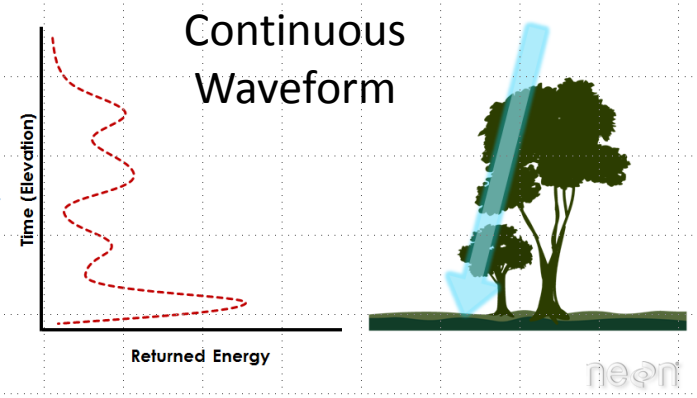

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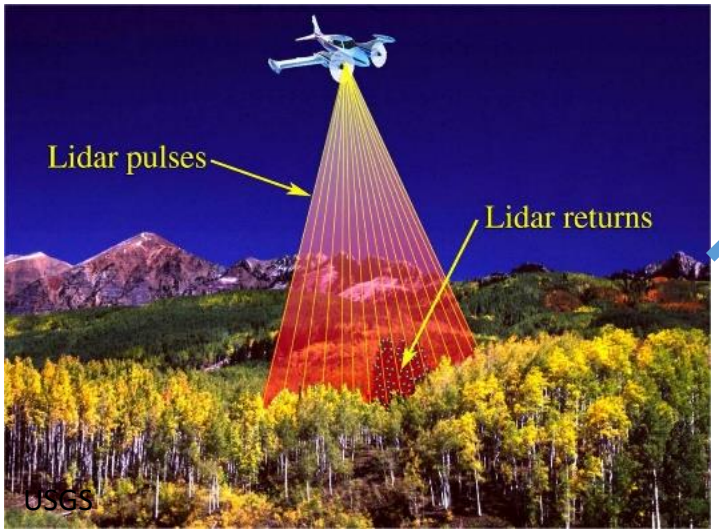
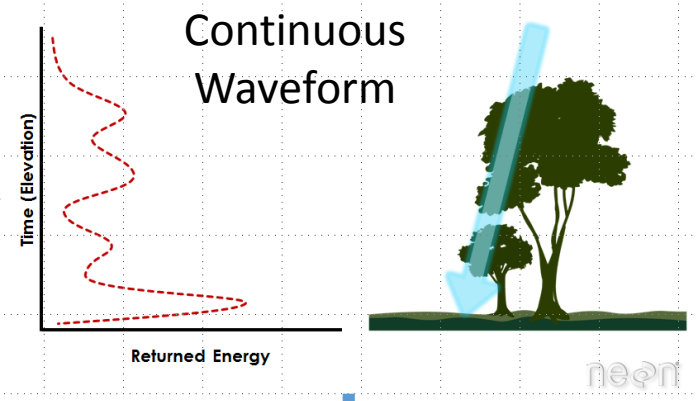
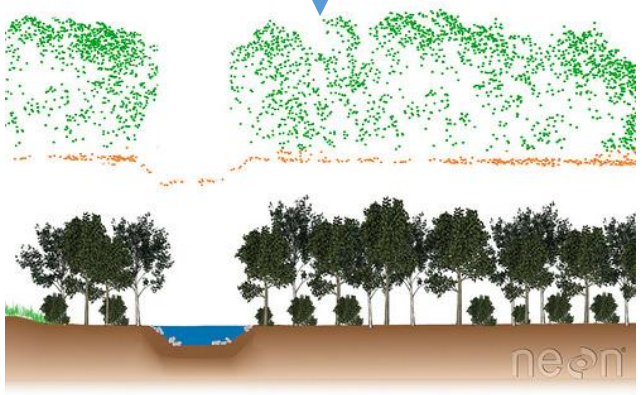
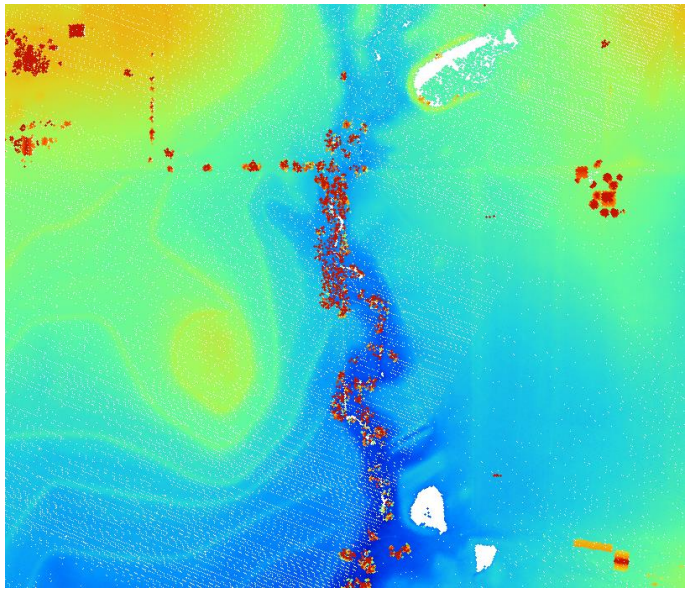




Discrete Return



A Sample of Oklahoma LiDAR Data
(near Durant, OK)



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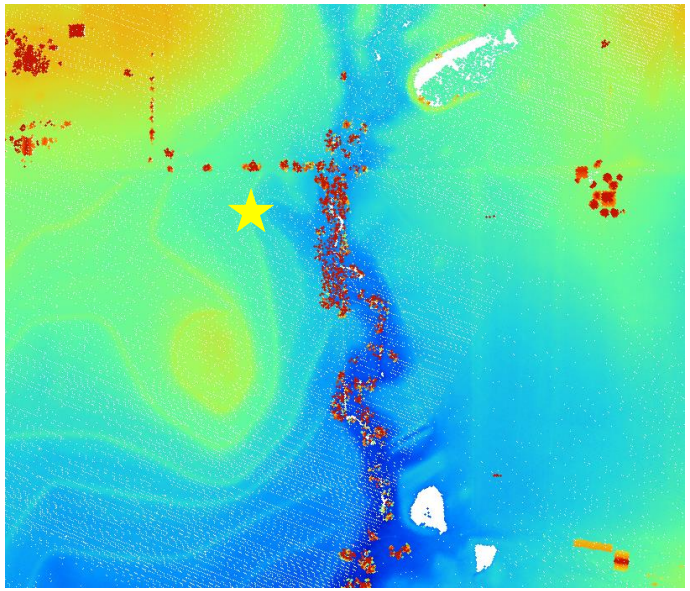
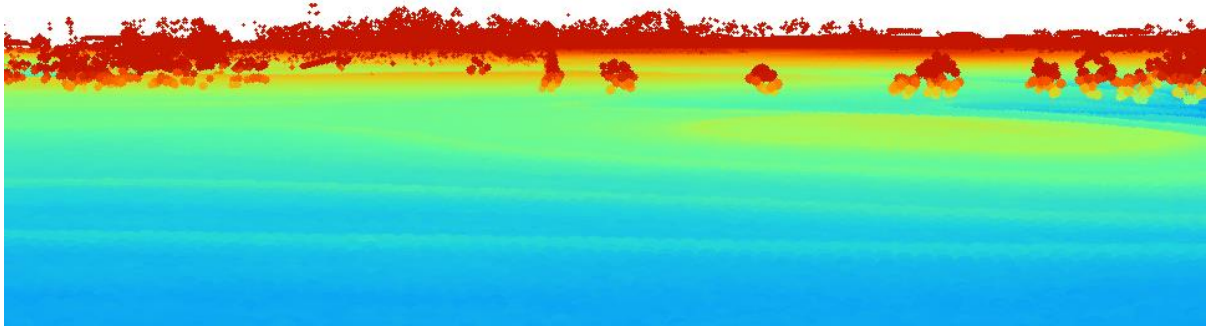
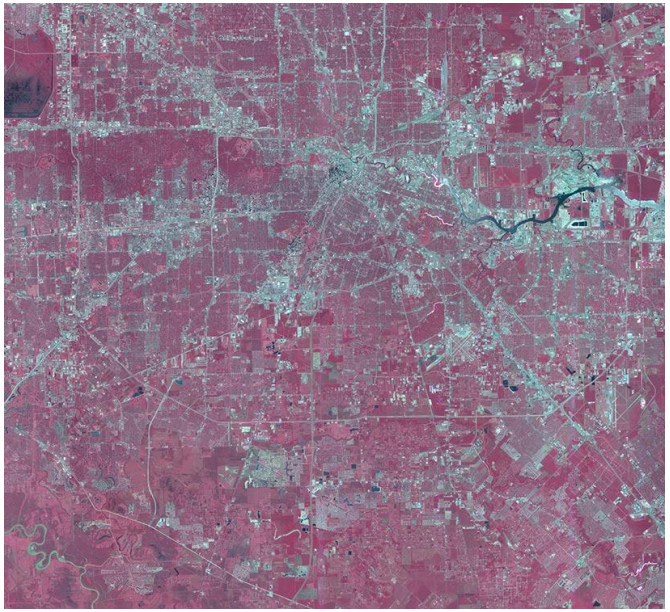




Advantages of LiDAR over Traditional RS Imagery



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- We can Extract **Different** Information
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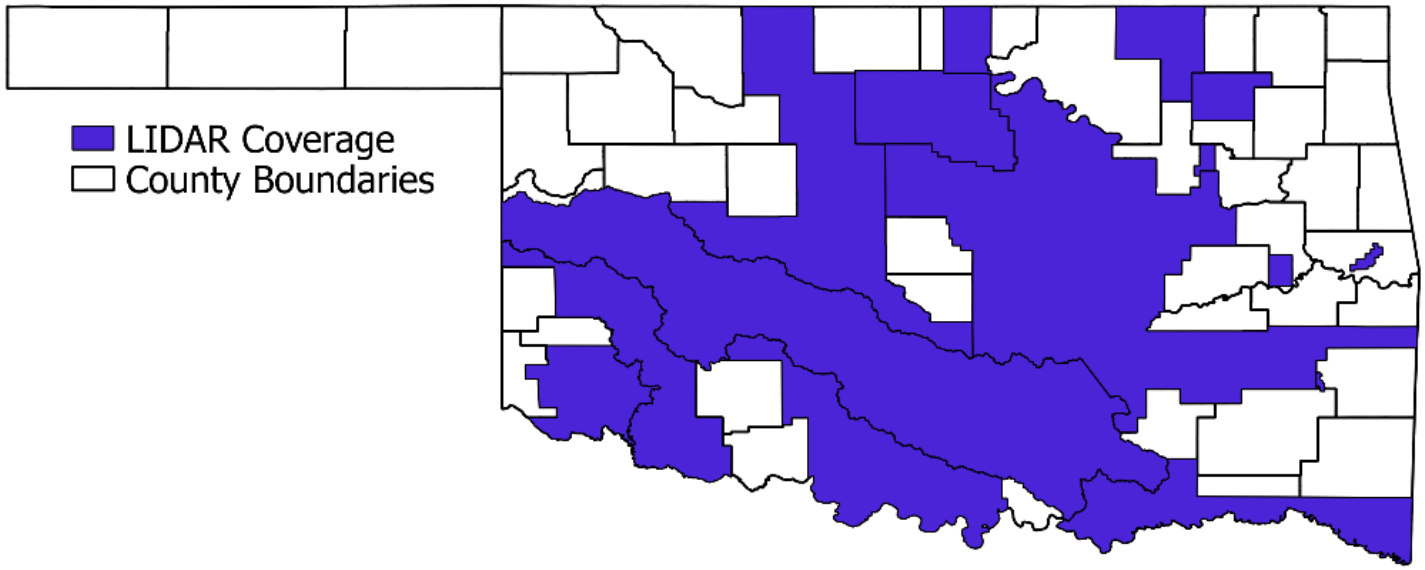
- LiDAR Products Complement Existing Remote Sensing Data
  - Different Data (e.g., LiDAR + 1 m NAIP Imagery) can be Fused for Analyses and Classification

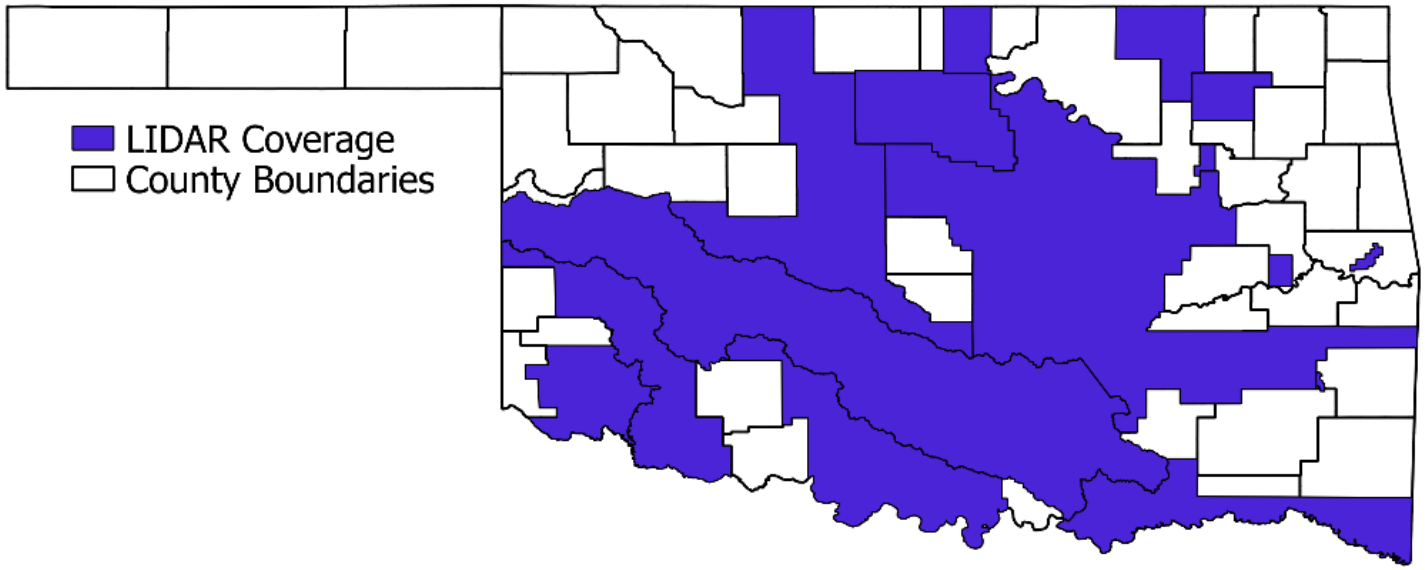
What is Available for Oklahoma:

- 40% of the State, ranging 2006-2013
- Fairly Standard Sampling (1.2-1.4 m point spacing)
- Publically Available from USDA -NRCS



Current Limitations/Challenges:

- Data Are Only Available as Point Clouds
  - Limited Stand-Alone Utility
- Download Limitations (i.e., difficult to Obtain Full Dataset)



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- Produce Useful GIS Data Products:
  - Canopy Height Models
  - High Resolution Elevation Models
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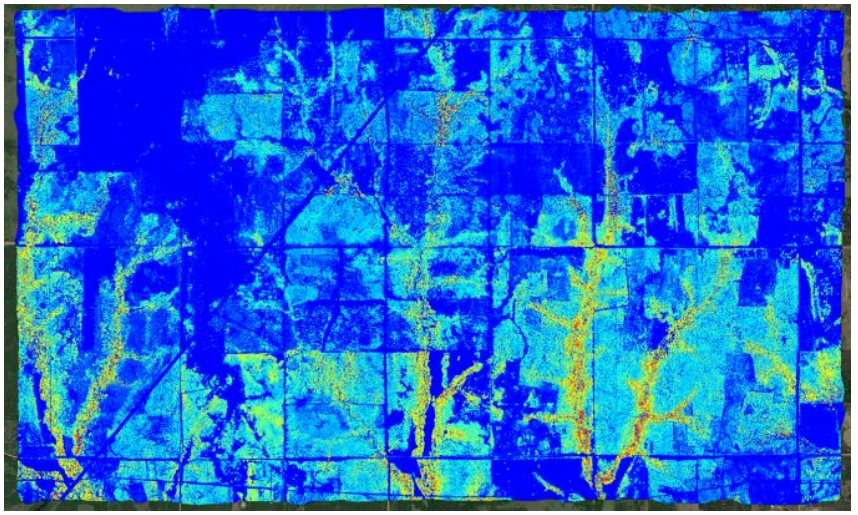

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- Establish Protocols using Free and Open Source Software for Reproducibility

Projected Benefits:

- Academic Research and Management Based on Data Products
- Incentive to Acquire Seamless Data for Remainder of State
- Established Protocols and Scripts Will Ease Large-Scale Processing of Future LiDAR Data

Current Status:

- Point Clouds Acquired and Uncompressed

  (~6 TB; ~30,000 Files)

  - Metadata Extracted and Data being Reprojected as Needed

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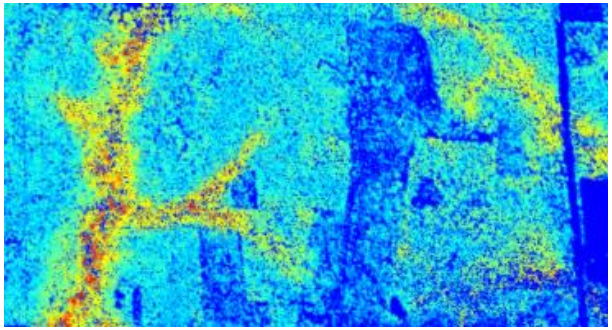
High Performance Computing Center

- Creating Full Spatio-Temporal Inventory
- Preliminary Workflows Tested on Small Sample Areas



Acknowledgements:

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- Ron Bonett (*University of Tulsa*)

- Oklahoma NSF-EPSCoR Program (*Grant No. IIA-1301789*)

Thoughts? Comments? Questions?