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Cyberinfrastructure-based distribution pathways to enable access to community LiDAR topography

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The GEON project (www.geongrid.org) has developed a cyberinfrastructure-based system to provide online access to multi-billion point, high-resolution, LiDAR topography datasets. The GEON LiDAR Workflow (GLW) is available as a portlet in the GEON portal (portal.geongrid.org/lidar) and is in use for a number of earth science studies. Example applications of these data including mapping of active faults in California to better understand earthquake potential, studies of landscape development in coastal California, and for validation of satellite remote sensing data. Currently, the GEON LiDAR portlet serves five datasets totaling over seven billion data points and approximately 2.5 TB. This system has been selected as the primary distribution pathway for LiDAR data to be acquired by the GeoEarthScope component of the NSF-funded EarthScope project (which will entail more than 20 billion additional points and a significantly larger user community).

In order to address the distribution of both LiDAR point data as well as standard, high-resolution digital elevation models (DEMs) produced from LiDAR, we have developed multiple pathways for users to access data. We employ a Google Maps and/or Google Earth-based interface to allow users to browse and download tiled 0.5 m digital elevation data. For users who wish to explore the full potential of the LiDAR data, we provide access to the raw LiDAR point data as well as a suite of DEM generation tools to enable users to generate custom DEMs to best fit their science applications. Through these multiple pathways, we are able to service various user communities

and thereby democratize access to these challenging community datasets.

Currently, the GEON LiDAR Workflow has over 180 users who have processed over 44 billion LiDAR returns and downloaded more than 1000 DEM tiles. Future GLW work includes expanding the current approach to develop a more generic workflow that will permit users to query, process, and calculate common derivatives for DEMs of various resolutions and origins.