

## Single-Photon LiDAR for Measuring & Monitoring Forest Carbon Fluxes

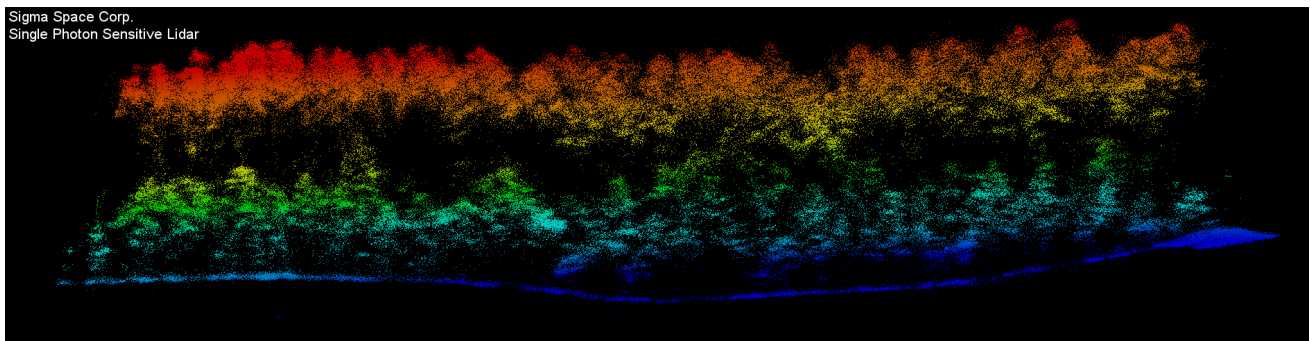
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Remote-sensing for detecting areas of "deforestation and forest degradation" is a relatively mature field though not without challenges. In comparison, current methods for quantifying the carbon fluxes associated with those areas are much more expensive and much less accurate. Quantifying fluxes for a large number of discrete areas across a country is especially difficult, whether they are spread out across the U.S., as planned for California offsets, or across Indonesia as planned for Australian offsets.

At recent meetings of the National Aeronautics and Space Administration Carbon Monitoring program and the United States Government SilvaCarbon program, forest-monitoring experts confirmed that airplane-mounted LiDAR could play a unique role in improving estimates. It was also recognized that technical limitations of conventional LiDAR systems make the acquisition of large amounts of high-fidelity 3D images prohibitively expensive.

Sigma Space Corporation has built and demonstrated a Single-Photon LiDAR, which enables rapid and broad LiDAR coverage while maintaining the high 3D resolution and the density of range returns needed for accurate measurements of forest structure and above ground biomass. Consequently, Single-Photon LiDAR will allow, for the first time, cost-effective measurement and monitoring of large forested areas with sufficient accuracy to inform "results-based" payments for mitigation activities in the forest sector (e.g. REDD+).



**Figure 1.** Sigma Space Corporation, Single Photon Sensitive LiDAR.