USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE
Geospatial Technology and Applications Center
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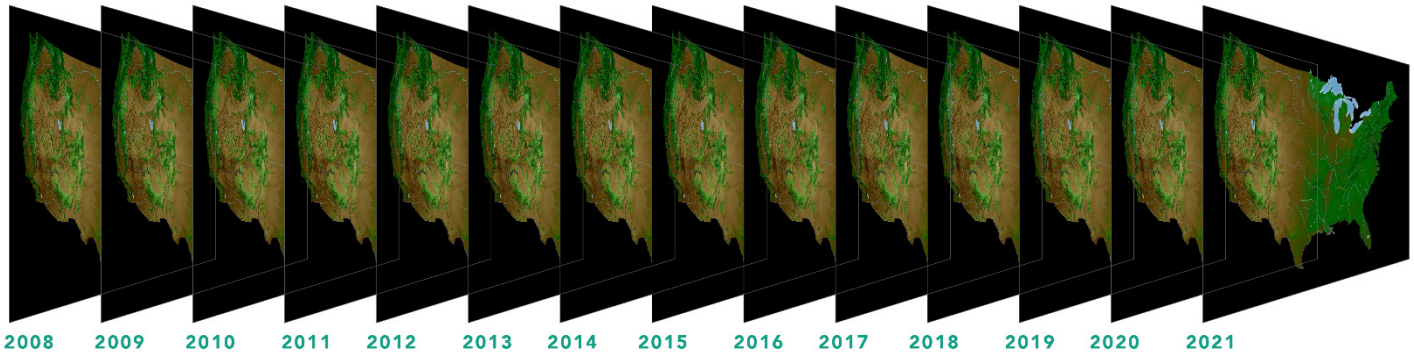
Mapping Tree Canopy Cover

The newest Forest Service Tree Canopy Cover (TCC) product suite is now available for the conterminous United States, southeast Alaska, Hawaiian Islands, Puerto Rico, and the U.S. Virgin Islands. The annual 30-m spatially continuous TCC data contains valuable information for monitoring, managing, and understanding forest dynamics.

Why is tree canopy cover Important? Tree Canopy Cover:

- Influences Biodiversity
- Regulates Microclimates
- Connects Habitats
- Impacts Climate Warming
- Impacts Nutrient Cycling
- Sequesters Carbon



How are tree canopy cover maps created?

Data from 55,000 Forest Inventory and Analysis plots were intersected with spectral and topographic data to create random forest models and develop annual TCC maps. The massive computing and storage capacity of Google Earth Engine (GEE) was leveraged to make annual temporally smoothed composites comprised of both Landsat and Sentinel-2 satellite images. The temporally smoothed composites allowed for the random forest models created for one time period to be applied to many time periods. Being able to map TCC through time has ushered in a revolutionary phase in time-series data and its mapping. Advanced time-series and modeling techniques produce more complete, accurate and frequent tree canopy cover maps.

Where can the tree canopy cover data be accessed?

- The TCC datasets are available annually from 2008 – 2021 and can be accessed in the GEE catalog and at the following link: https://data.fs.usda.gov/geodata/rastergateway/treecanopycover/index.php
- Science TCC products includes the mean and standard deviation (also referred to as standard error) of the TCC values predicted by the random forest regression models.
- NLCD TCC products undergo further post-processing than the Science TCC products. This involves several masking, filtering, and minimum-mapping unit routines, as well as processes that reduce interannual noise and return longer duration trends.

For more information contact sm.fs.tcc@usda.gov