**CMS Biomass Pilot Project**

**US Forest Biomass Maps (Circa 2005)**

**Summary:**

To support both carbon science and carbon management, the CMS-Biomass pilot project (referred hereafter as CMS-Biomass) is designed to pursue a multi-scale approach to generate the “best of kind” quantification of above-ground forest biomass for the US using a broad combination of NASA remote sensing, forest inventory, and ancillary data. Traditionally, above-ground forest biomass for the US has been quantified using the US Forest Service Forest Inventory and Analysis (FIA) data. FIA plots, based on a nominal 5km sample spacing, record structural attributes (including DBH and tree height), stand demographics (age, number of stems, growth, removals, and mortality), and composition. Plot-level biomass is calculated by applying species- or type-specific allometric relationships (e.g. Jenkins et al, 2003) to individual tree DBH and/or height measurements. This approach provides an accurate estimate of US forest biomass at broad spatial scales that will be used as the “Golden Standard” to be compared with the CMS-Biomass maps of forest carbon.

To perform the analysis, CM-Biomass Team will rely on a multi-scale approach using a variety of datasets to quantify biomass. In doing so, the team will:

1. Leverage multiple remote sensing inputs (e.g., MODIS, PALSAR, GLAS, Landsat) in combination with FIA plot data to map forest biomass across the US at resolutions of 100-500m.
2. Supplement the national mapping with local-scale mapping at resolutions of 30-100m using wall-to-wall airborne lidar and radar datasets and dense field measurements.

The national-scale mapping is designed to benchmark the “best possible” estimation of biomass available from current measurements. ICESat GLAS waveforms will be linked to FIA-measured biomass via the Lorey’s Height metric. These waveforms (converted to biomass) will then be used as training for statistical models of biomass, with input data consisting of geospatial inputs (e.g., MODIS, PALSAR, climate, topography, Landsat disturbance, Landsat LAI).

**Data Citation:**

**Cite this data set as follows:**

CMS US Forest Biomass Map:

**Team Members:**

**NASA/JPL:** Saatchi S, Yifan Yu, Fore, Alex, Nuemann, M., Chapman, B., Nguyen,

**NASA/ARC:** Nemani, R., Ganguly, S., Zhang, G., Votava, P.,

**NASA/GSFC**: Masek, J., Tucker, C., Hall, F., Nelson, R., Cook, B.

**USDA/FS:** Birdsey, R., Healey, S., Johnson, K.,

**UMD:** Dubayah, R.

**CSU:** Lefsky, M.

**Data Characteristics:**

**Data Layers:**

**AGB: Aboveground Biomass Density (Mg/ha)**

**Lorey H: Basal Area Weighted Height (m)**

**NLCD: Filtered National Land Cover Data**

**Percent Uncertainty: Biomass Error Map (±%)**

Projection: Geographic Lat/Lon

Geodetic Datum: WGS-84

Data Type: 32 bits Floating point

Compression Type: Geotiff

**Site boundaries:** (All latitude and longitude given in degrees and fractions)

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| --- | --- | --- | --- | --- | --- | --- |
| **Site (Region)** | **Westernmost Longitude** | **Northernmost Latitude** | **Lines** | **Samples** | **Pixel Size (degrees)** | **Unit** |
| US-East AGB | - 96.1111400 | 50.0000000 | 13100 | 12000 | 0.0022222 | Mg/ha |
| US-East  Lorey H | - 96.1111400 | 50.0000000 | 13100 | 12000 | 0.0022222 | Meter |
| US-East  NLCD | - 96.1111400 | 50.0000000 | 13100 | 12000 | 0.0022222 | Class Type |
| US-East  Percent Error | - 96.1111400 | 50.0000000 | 13100 | 12000 | 0.0022222 | % uncertainty |

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| --- | --- | --- | --- | --- | --- | --- |
| **Site (Region)** | **Westernmost Longitude** | **Northernmost Latitude** | **Lines** | **Samples** | **Pixel Size (degrees)** | **Unit** |
| US-West AGB | - 125.00000 | 50.000000 | 13000 | 12000 | 0.0022222 | Mg/ha |
| US-West  Lorey H | - 125.000000 | 50.000000 | 13000 | 12000 | 0.0022222 | Meter |
| US-West  NLCD | - 125.000000 | 50.000000 | 13000 | 12000 | 0.0022222 | Class Type |
| US-West  Percent Error | - 125.000000 | 50.000000 | 13000 | 12000 | 0.0022222 | % uncertainty |

**Data Application and Derivation:**

Data should be used for validation and comparison with other national and local maps. This is a preliminary product with limited validation and uncertainty analysis. We will be using the FIA data to validate and improve the accuracy and the spatial resolution of the data to 3 arcsec (~90 m).

**Quality Assessment:**

Will be performed by the CMS team to guide the final production of the map.

**Data Acquisition Materials and Methods:**

N/A

**Data Access:**

[http://carbon.jpl.nasa.gov/](http://www-radar.jpl.nasa.gov/carbon/)

**Data Archive Center:**

**Contact for Data Center Access Information:**

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**Product Availability:**

...Requested data can be provided electronically on the anonymous ftp by providing an official request.

**Reading the Media:**

N/A

**Software and Analyses Tools:**

N/A

**References:**

**N/A**