

USING FIA AND LANDSAT OBSERVATIONS TO IMPROVE THE SPATIAL AND TEMPORAL RESOLUTION OF FOREST CARBON ESTIMATES

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Abstract—For nearly a decade, the USFS FIA, NASA, and the University of Maryland have collaborated on the NASA/NACP funded North American Forest Dynamics (NAFD) project, and developed new approaches for annual mapping of CONUS forest dynamics (1984-2011). Building on this foundation of empirical research and results, the collaboration will continue with a new Carbon Cycle Science Synthesis Research effort to improve the spatial and temporal estimation of forest related carbon emissions. This newly funded study will 1) produce annual age and biomass maps and 2) use these national products to advance estimates from a Carbon Bookkeeping model. The work will allow the model to calculate carbon fluxes from forest disturbances and post-disturbance recovery processes with unprecedented spatial and temporal details. Using NAFD disturbance maps and spectral trajectories from Landsat time-series stacks, forest areas can be separated into three broad age categories. “Young” forests had stand-clearing disturbance occurring with known year between 1985 and 2013. “Middle-aged” forests are areas recovering to forest include pixels that were not identified as forest (spectrally) in 1984 but became forested in later years, or forests that grew substantially over 30 years as indicated by trends in the 30-year Landsat surface reflectance record. “Old” forests include locations that remained forested between 1984 and 2014 and showed no obvious trend in the 30-year Landsat record. During this presentation, the three- tiered approach to model per pixel estimates of age and biomass using NAFD products and FIA plot data will be discussed along with results from prototype studies and updates to the bookkeeping model.

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