

Estimating and reporting GHG emissions and removals from forest land and HWPs in the US

Grant Domke

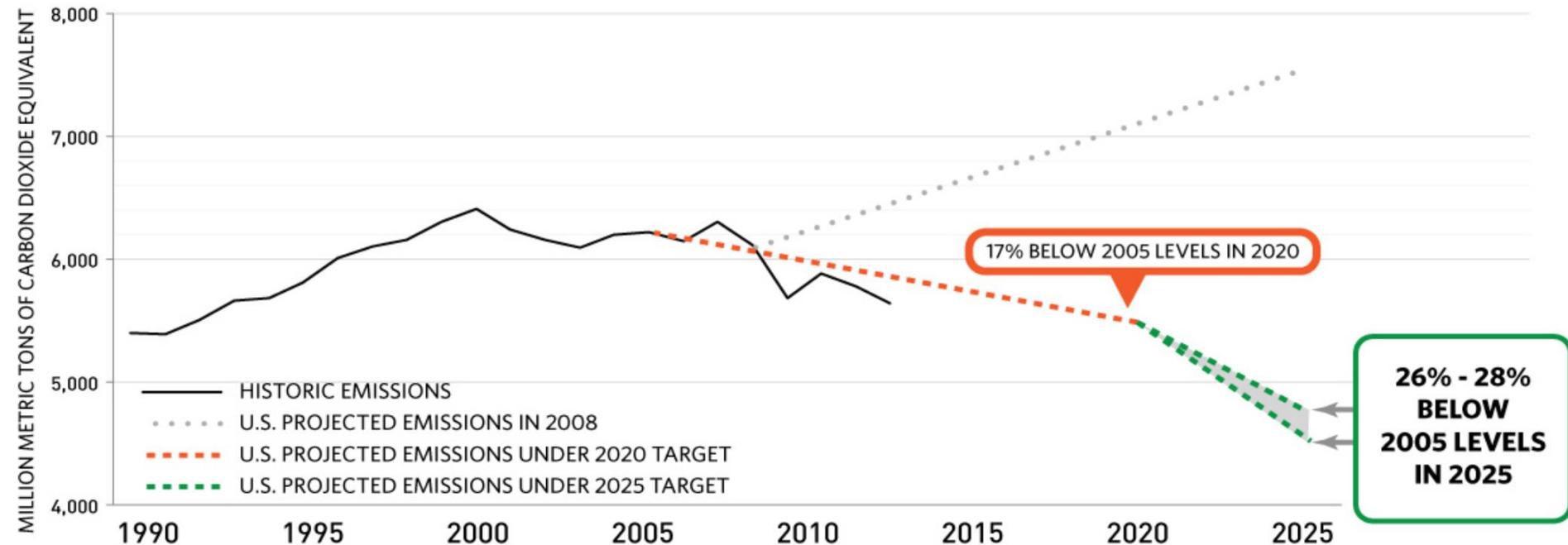
Forest Service cooperators: Brian Walters (NRS), John Coulston (SRS), Jim Smith (NRS), Mike Nichols (NRS), Chris Woodall (NRS), Dave Wear (SRS), Sean Healey (RMRS), Charles Perry (NRS), Andrew Gray (PNW), Warren Cohen (PNW), Hans Andersen (PNW), Chris Oswalt (SRS), James Westfall (NRS), Chris Swanston (NRS), Ty Wilson (NRS), Greg Liknes (NRS), Andy Hudak (RMRS), among others

University and Agency cooperators: Matthew Russell (UMN), Anthony D'Amato (UVM), Steve Ogle (CSU), Shawn Fraver (UMaine), Aaron Weiskettel (UMaine), Eric Marland (App. State), Mark Harmon (OSU), Mark Ducey (UNH), Lucas Nave (UMichigan), Dave McGuire (UAF), Sassan Sacchi (NASA JPL), Sangram Ganguly (NASA Ames), Phil Radtke (VPI), Mike Falkowski (CSU), Rodrigo Vargas (UDelaware), Steve Hagen (AGS), among others



Recent commitments

U.S. EMISSIONS UNDER 2020 AND 2025 TARGETS



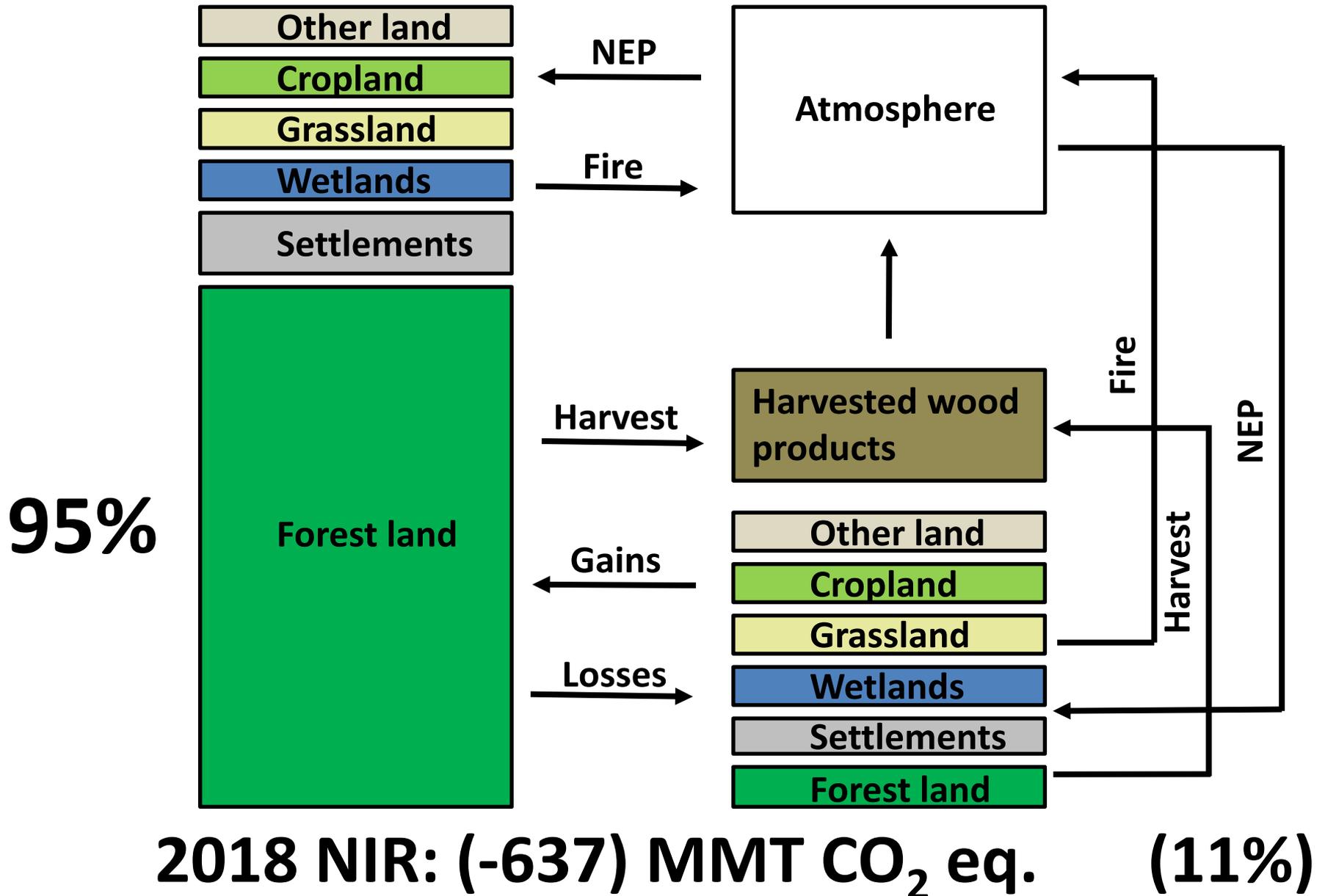
Current position on Paris Agreement

- Intent to withdraw unless new terms are established
- Continue to engage in the process
- Focus on the rulebook and ensuring that US priorities are reflected
- Transparency in estimation and reporting is critical

Reference Levels

- The US has not and is not intending to establish reference levels specific to the land sector
- Clear and transparent information on baselines
- Updates and revisions are important as technical advancements are made and new data becomes available
- Updates and revisions to the NDC are allowed based on technical advancements

Context within the land sector



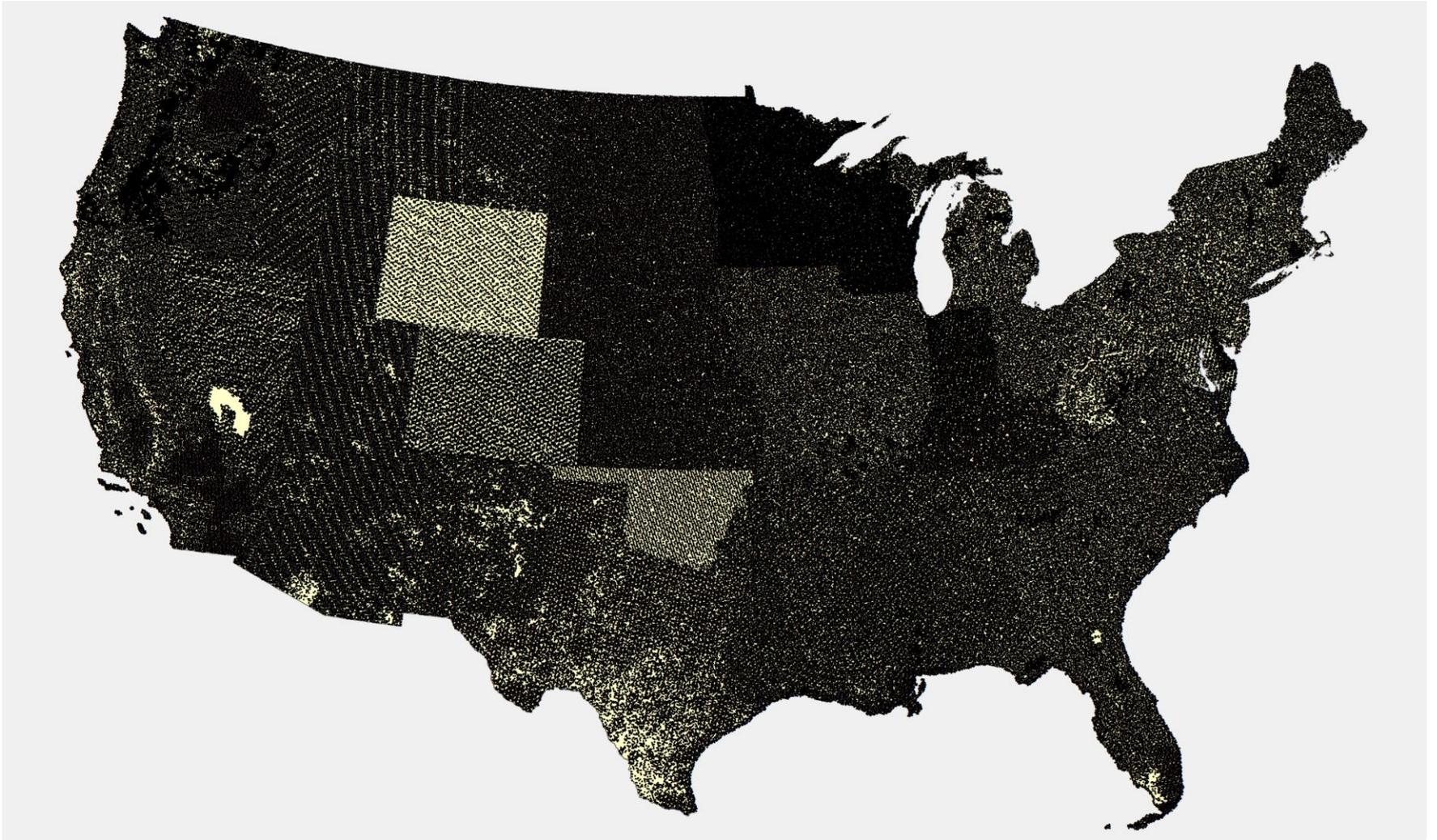
Estimation/improvements paradigm

“...inventories should contain neither over nor underestimates so far as can be judged, and the uncertainties in these estimates should be reduced as far as practicable.” – IPCC



- Expand the use of in situ plots
- Integrate auxiliary information
- Align national and international reporting instruments
- Maintain transparency and open access
- Incorporate emerging science
- Build partnerships
- Remain nimble to address ever-changing requests, guidance, and stakeholder needs

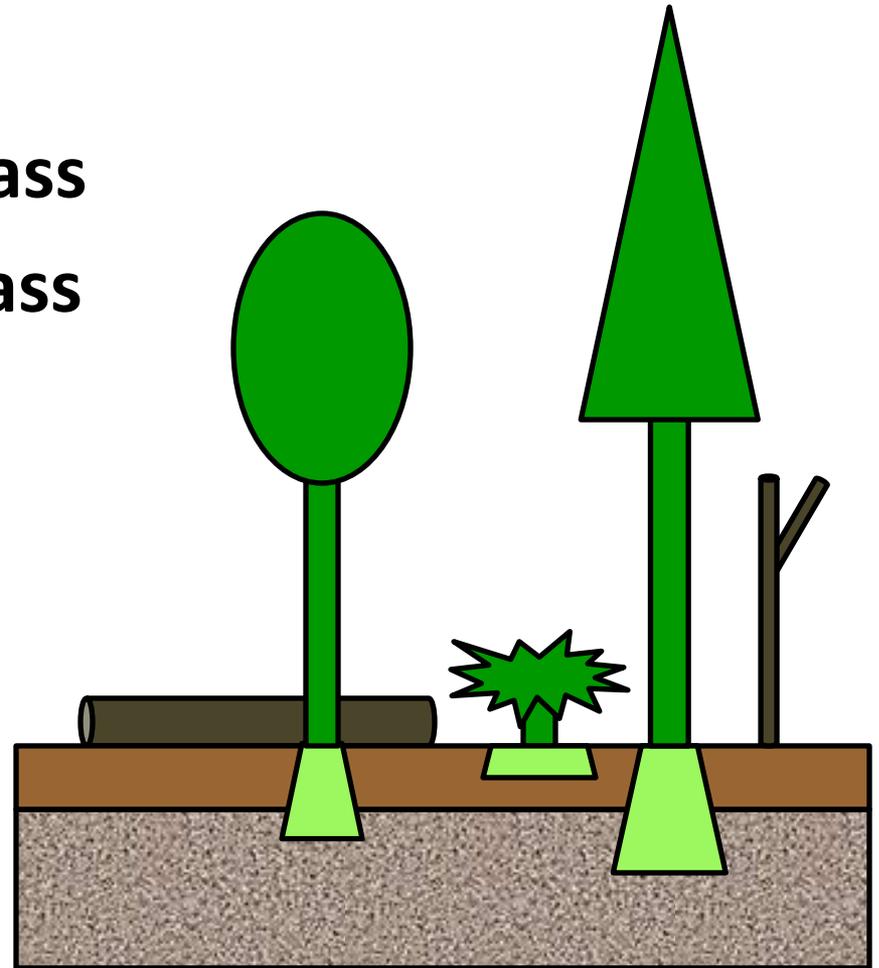
NFI plots on forest land = 127,235



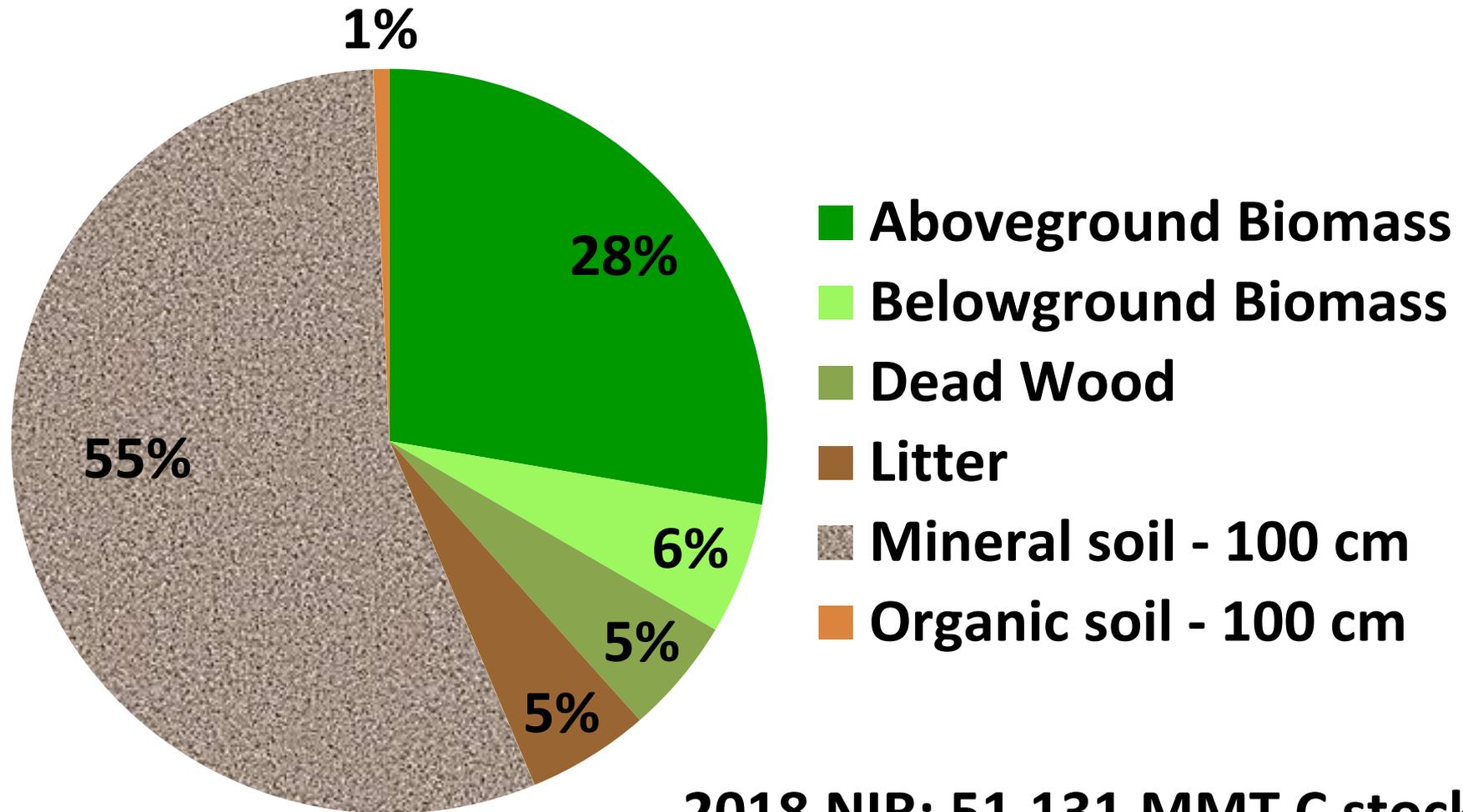
All plots = 316,359

Forest ecosystem C pools

- Aboveground live biomass
- Belowground live biomass
- Dead wood
- Litter
- Soil organic matter
 - Mineral
 - Organic

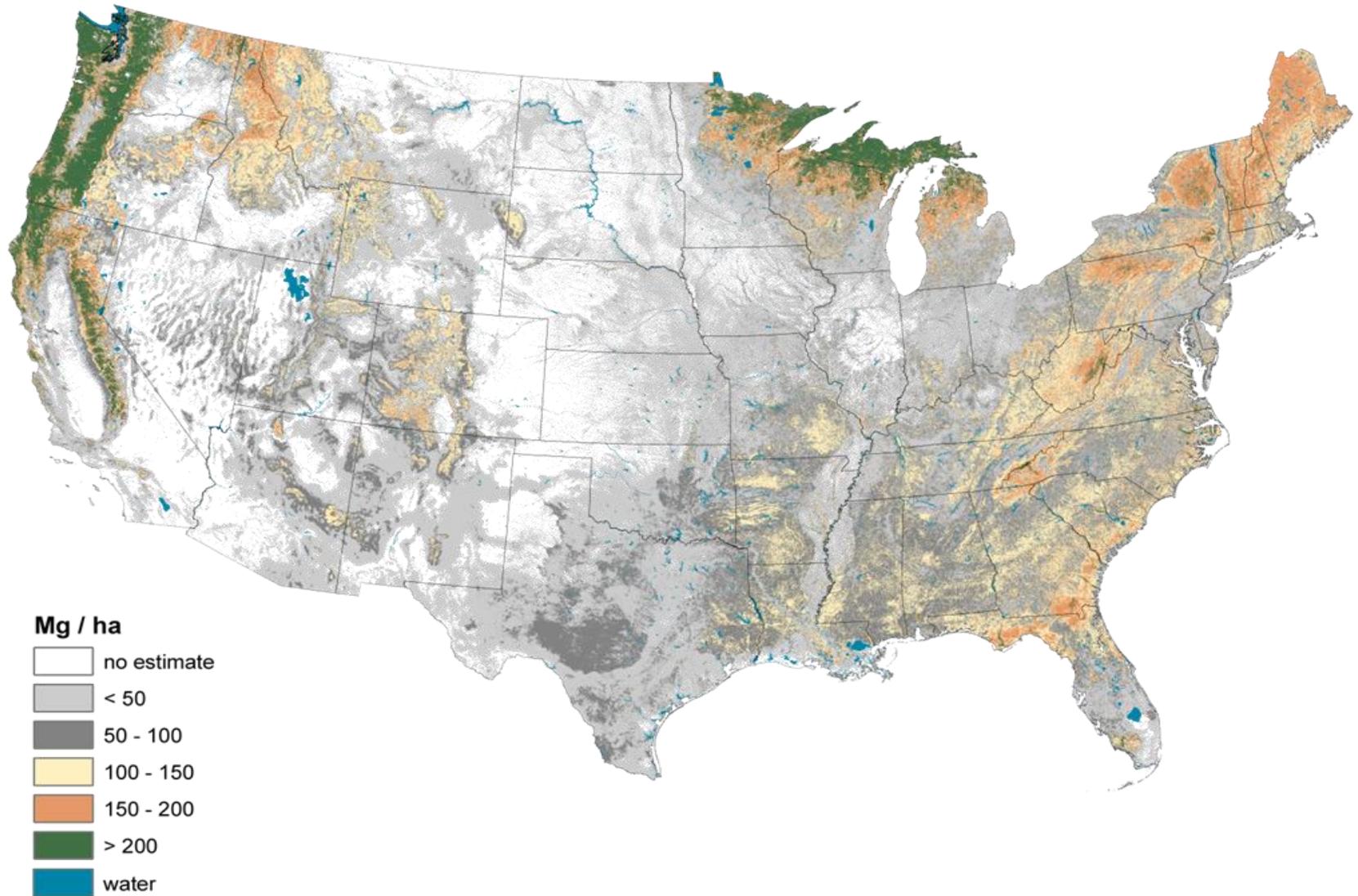


Forest C stocks by pool in the US

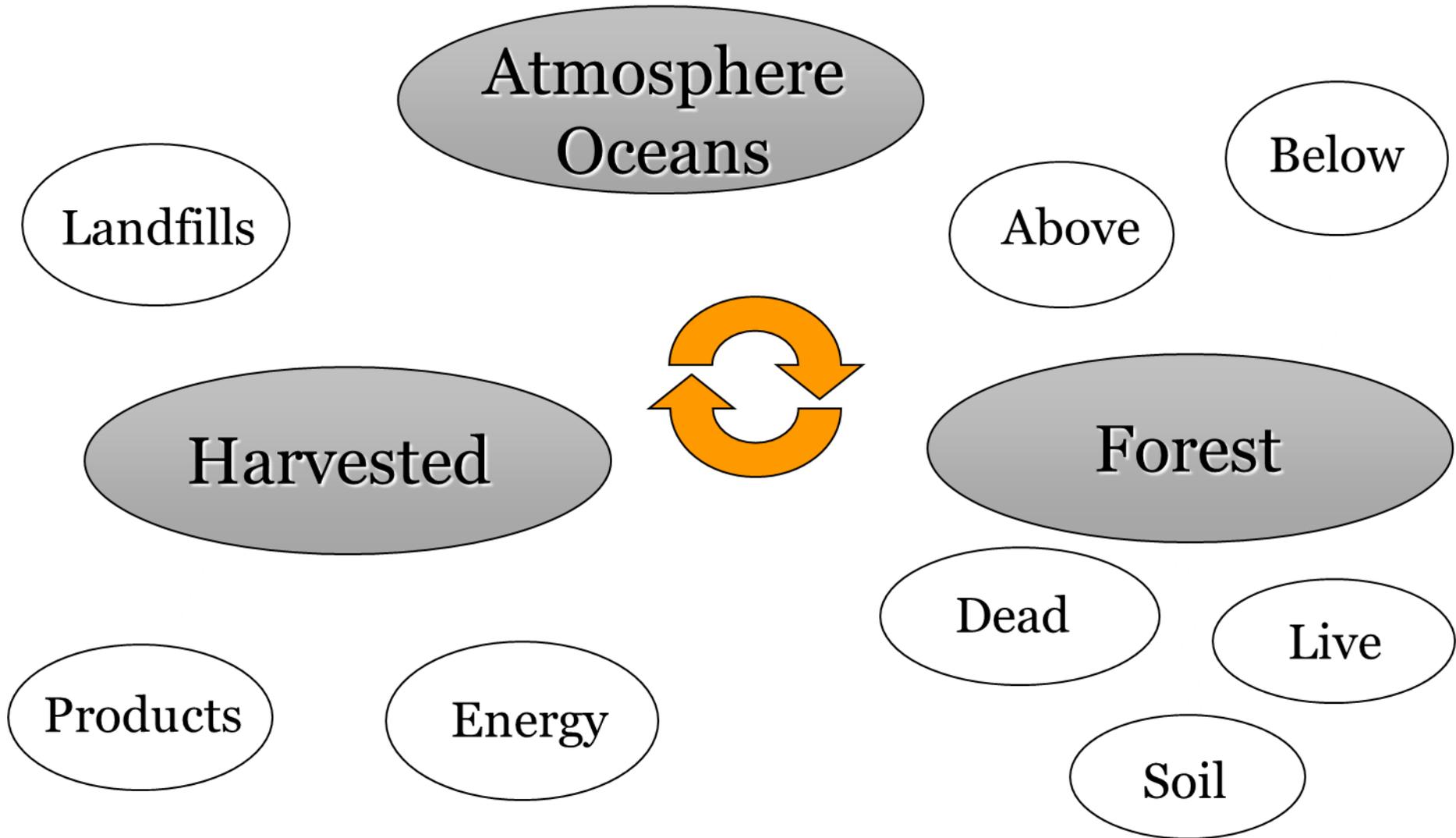


2018 NIR: 51,131 MMT C stocks

Distribution of forest land C in the US



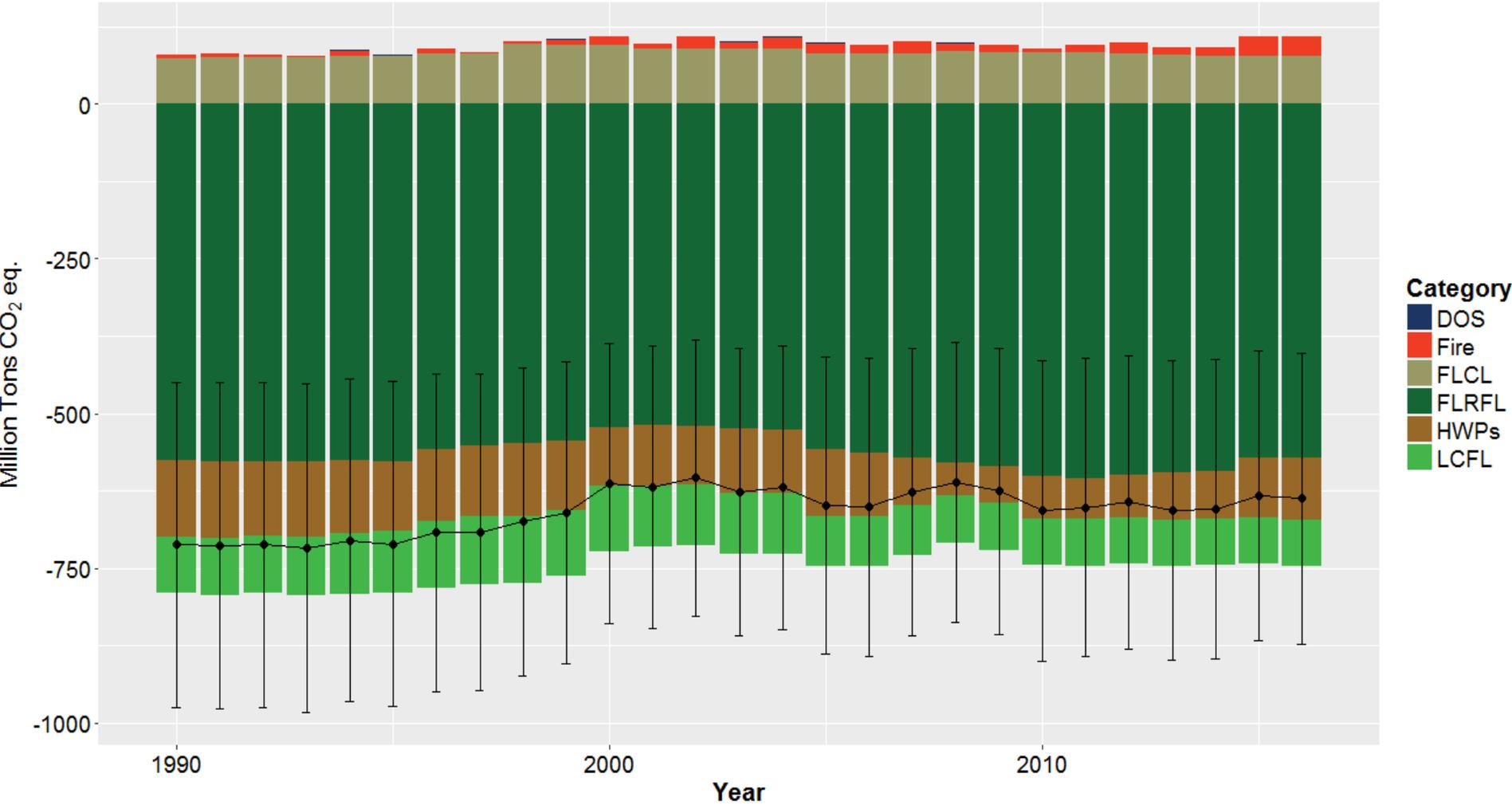
Harvested wood products



US approach for HWP estimation

- Report HWP using the Production approach (include estimates for all three approaches)
- Estimate C change in products in use and products in solid waste disposal sites
- Estimates compiled using the Woodcarb II model
- General framework is similar to IPCC model
- Key difference is greater product/end use resolution which allows for more differentiation among decay rates
- Increased resolution in conversion factors
- Estimates are primarily driven by national data (rather than FAO data)
- Uncertainty based on Monte Carlo analysis

Emissions and removals

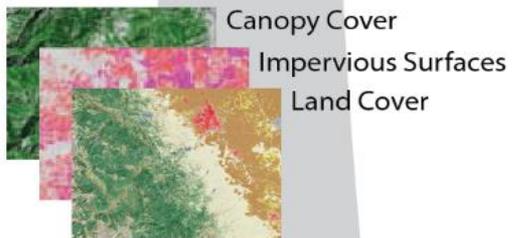


Remotely Sensed Data

Landsat Time Series



National Land Cover Database



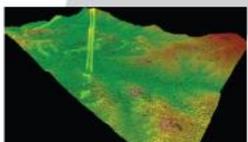
NAIP Imagery



MODIS Imagery



LiDAR



MTBS



FIA Data

Annual Inventory



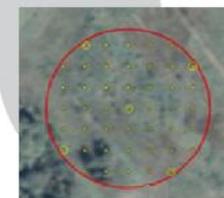
Periodic Inventories



Image-based Change Analysis

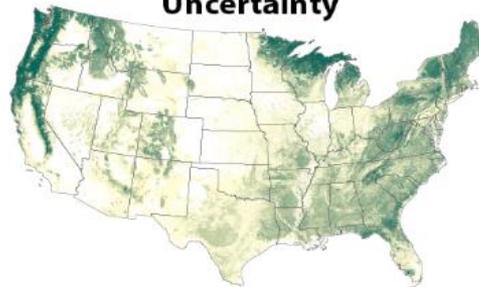
Time 1

Time 2



Carbon Accounting System

Forest Carbon Stocks & Uncertainty



Forest Carbon Stock Change & Uncertainty



Land Cover, Land Use and Land Use Change



Agriculture



Settlement



Carbon Estimates for Every Year

Final thoughts



- FIA data remains the foundation of GHG estimation and reporting
- Growing need for more spatially and temporally resolved information on GHG emissions and removals
- Work is on-going to improve and expand capabilities - collaboration and partnerships are essential
- Better inform policy and management decisions

Thank you

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FIA program: www.fia.fs.fed.us

FIA carbon: <http://www.fia.fs.fed.us/forestcarbon/>