Beyond MRV: High-Resolution Forest Carbon Modeling for Climate Mitigation Planning


1) University of Maryland, 2) MD Department of Natural Resources, 3) NASA-GSFC, 4) NASA-AIMES, 5) USFS, 6) University of Vermont

AGCI
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1. Introduction and Motivation
State Policy Context, Maryland, USA

• **Forest Preservation Act of 2013 (HB706)**
  
  **Synopsis:** Expanding the purpose and authorized uses of the Reforestation Fund to include tree planting on private land and financing the prevention of and response to forest health emergencies; defining the term "no net loss of forest"; altering the range of acres of land that a person is required to own or lease to be eligible for a specified income tax subtraction modification; exempting specified stream restoration projects from the requirements of the Forest Conservation Act; declaring the intent of the General Assembly; etc.

• **Greenhouse Gas Emissions Reduction Act of 2016 (SB323/HB610)**
  
  **Synopsis:** Repealing the termination date for a provision of law requiring the State to reduce statewide greenhouse gas emissions by 25% from 2006 levels by 2020; requiring the State to reduce statewide greenhouse gas emissions by 40% from 2006 levels by 2030; requiring the Department of the Environment to submit specified plans to the Governor and the General Assembly on or before specified dates; requiring the Maryland Commission on Climate Change to oversee a study of the economic impact of requiring specified reductions from the manufacturing sector; etc.
What is the carbon stock of forests?

What is the potential of forests to gain/loose carbon in the future?

How long will potential future changes in forest carbon take?
Initialization Cal/Val

Region (RGGI)

Ma et al. 2021
Annual Potential AGB (2011-2310)

50,742,200 ha

Ma et al., 2021
Fine-scale Heterogeneity

Forest gap

Urban trees
- AGB growth rate is a function of stand age, soil and climate.

**RGGI avg. reforestation potential:**
- 1.05 MgC/ha/yr (this study).
- 0.96 MgC/ha/yr (Cook-Patton et al 2020).
Climate Change Sensitivity

Ma et al. 2021
Gridded GEDI Avg Canopy Height (0.01°)

Gridded ICESat-2 Avg Canopy Height (0.01°)
Thank you!