National Aeronautics and Space Administration

NASA Carbon Monitoring System

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

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AGCI
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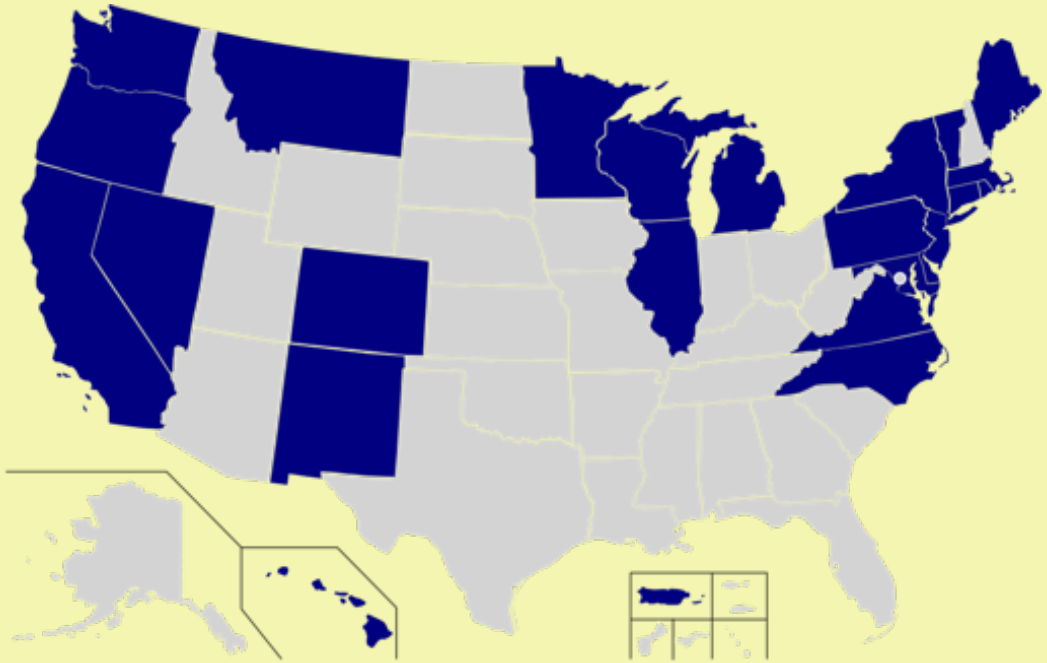
DEPARTMENT *of* GEOGRAPHICAL SCIENCES

UNIVERSITY OF MARYLAND

UNITED NATIONS
PARIS CLIMATE AGREEMENT
ENTRY INTO FORCE
— 4 NOVEMBER 2016 —

UNITED NATIONS DECADE ON
ECOSYSTEM RESTORATION
2021-2030

UNITED STATES
CLIMATE ALLIANCE
STATES UNITED FOR CLIMATE ACTION



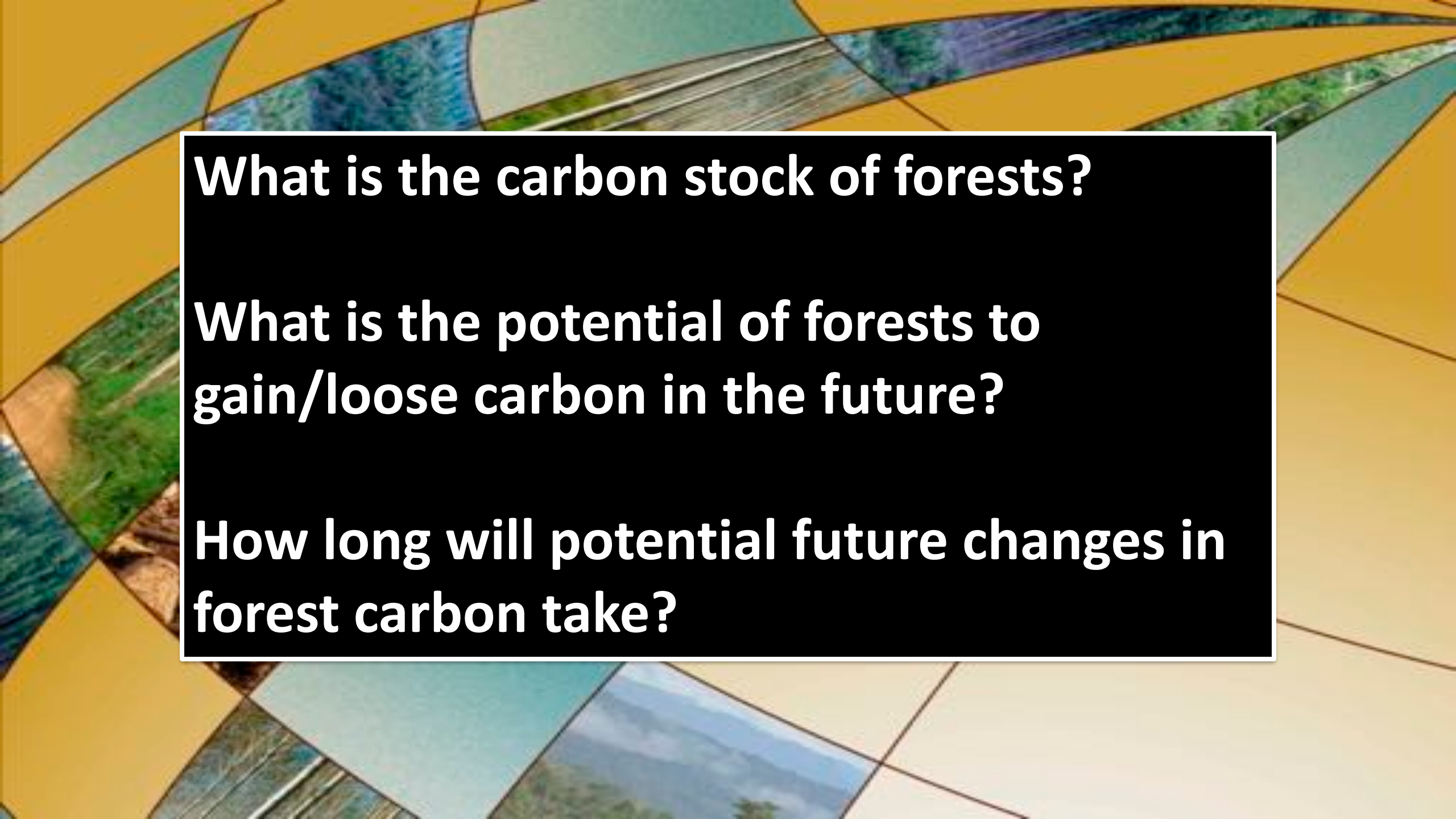
State Policy Context, Maryland, USA

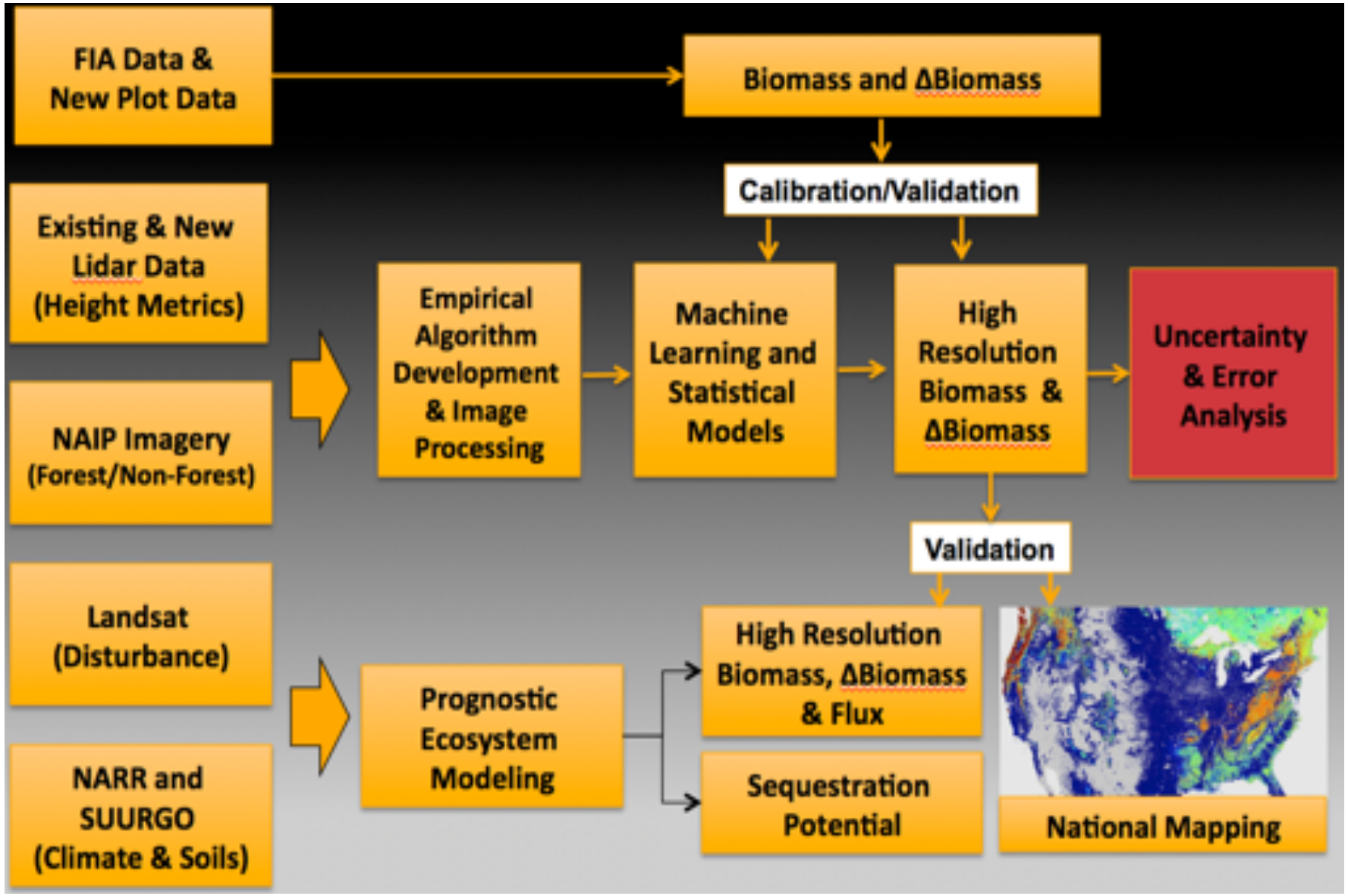
- **Forest Preservation Act of 2013 (HB706)**

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.

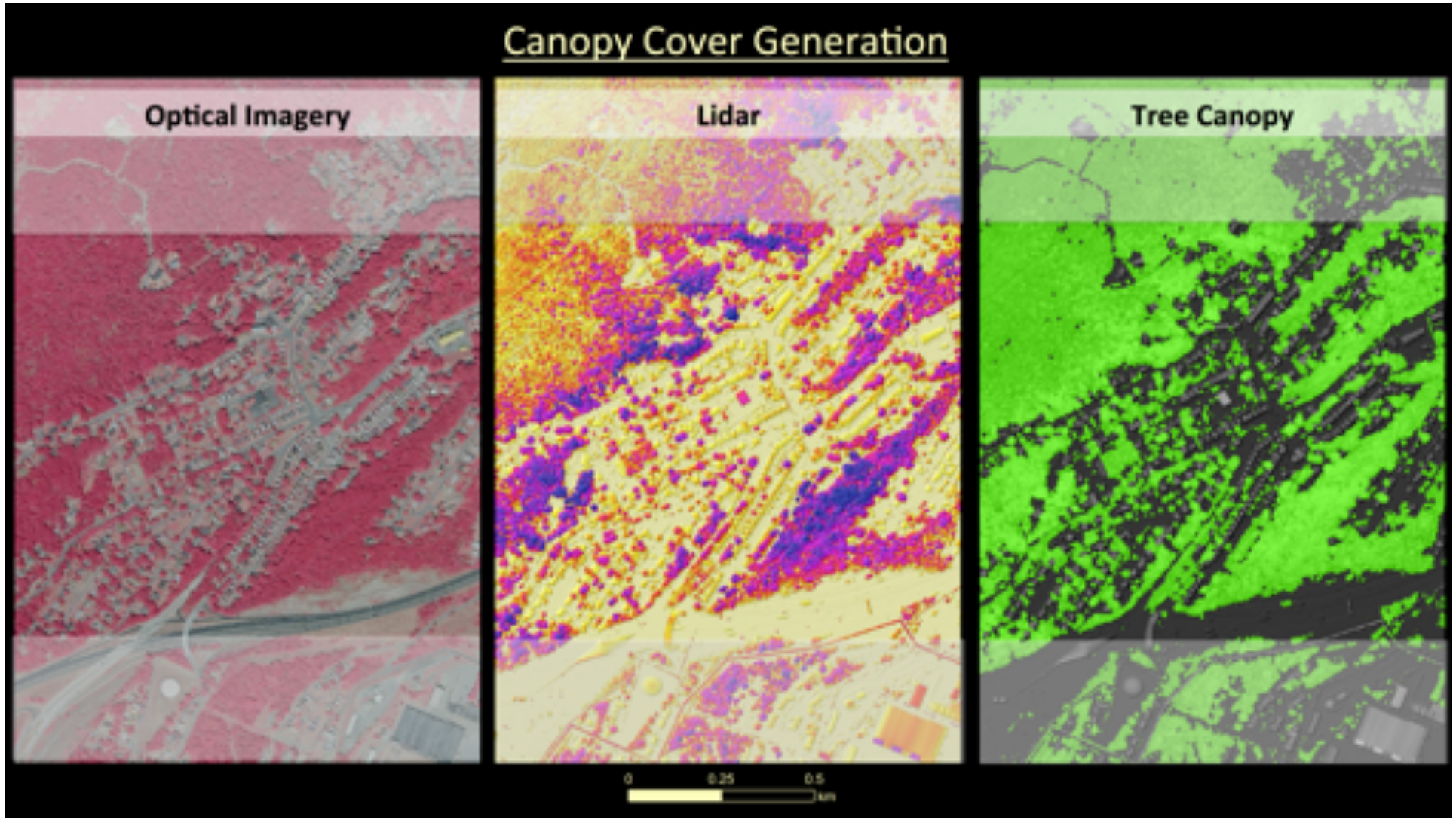
- **Greenhouse Gas Emissions Reduction Act of 2016 (SB323/HB610)**

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?



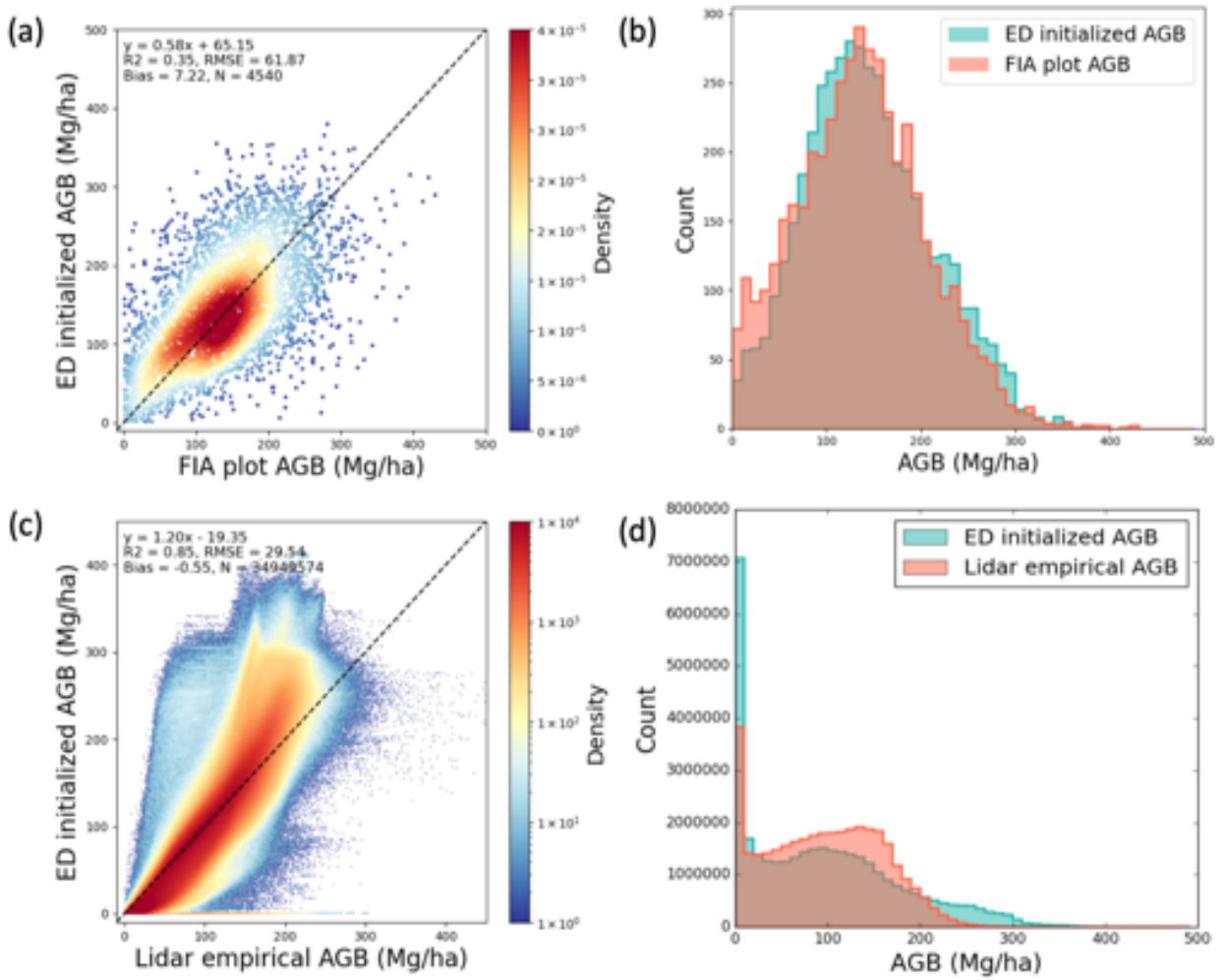
Hurtt et al. 2016



Hurtt et al. 2019

Initialization Cal/Val

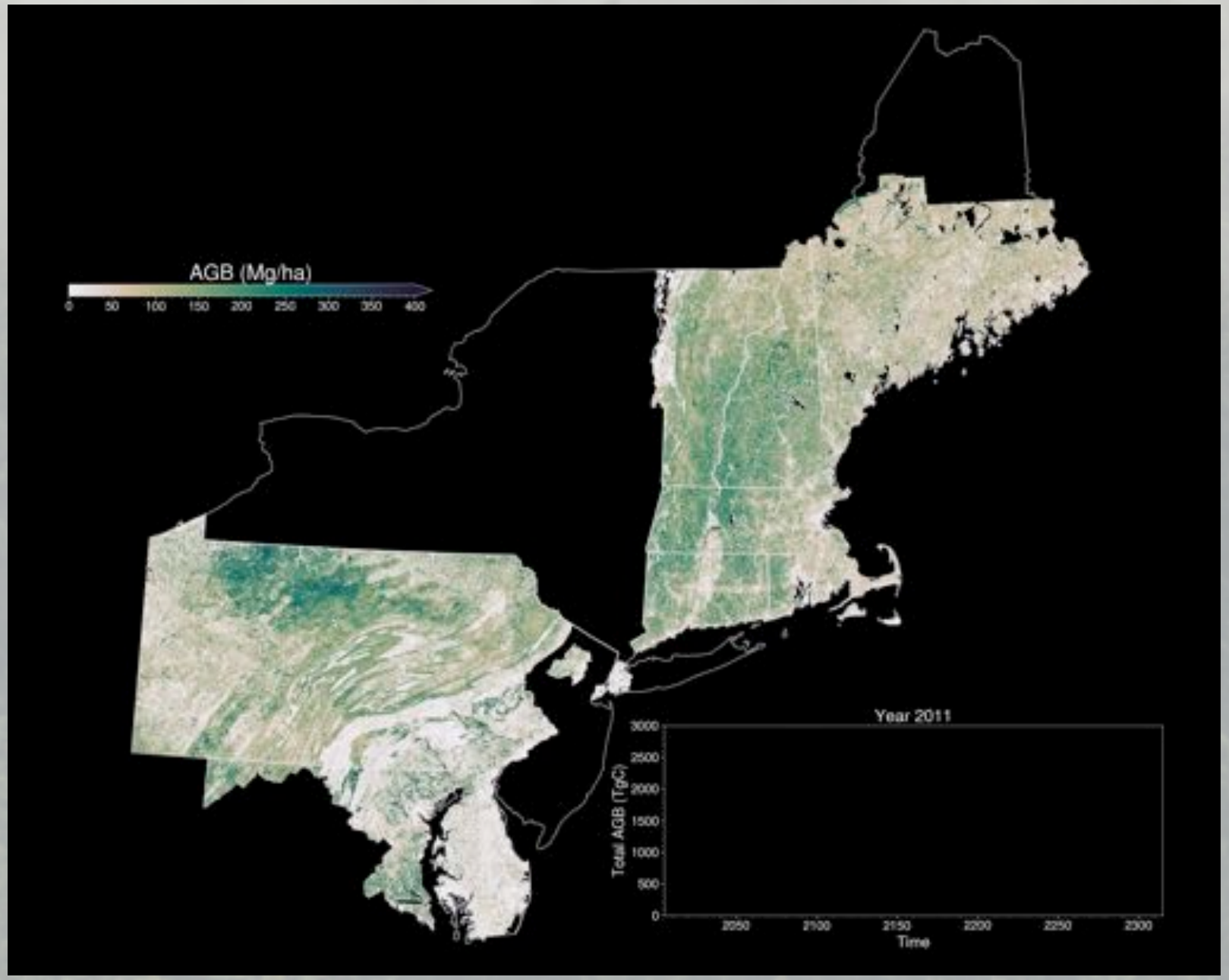
Region (RGGI)

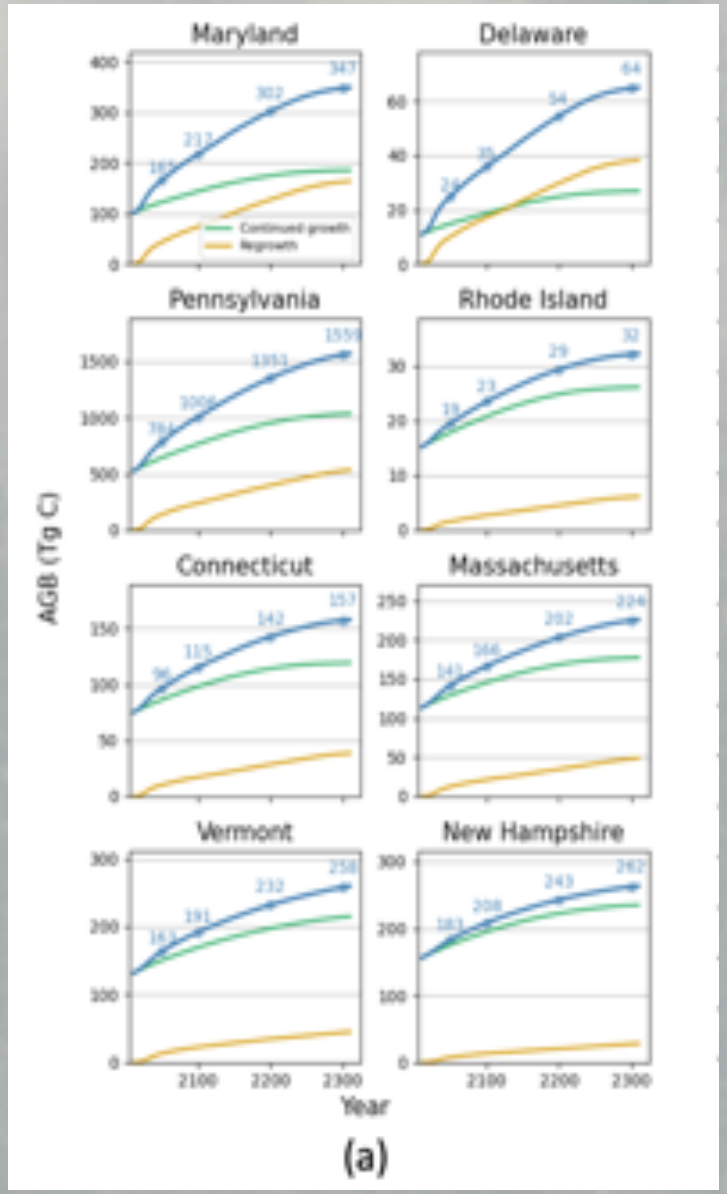


Ma et al. 2021

Annual Potential AGB (2011-2310)

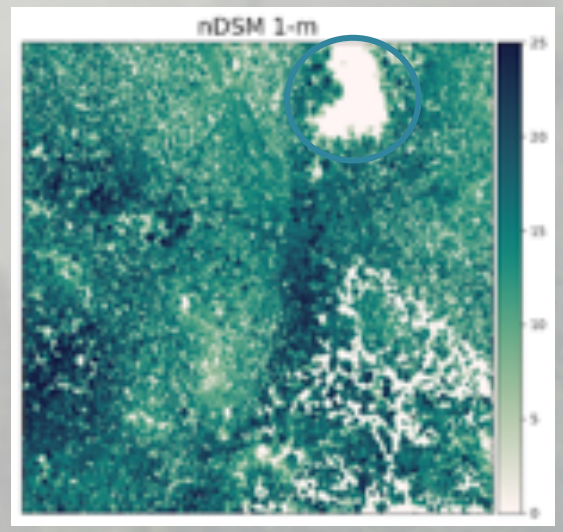
50,742,200 ha

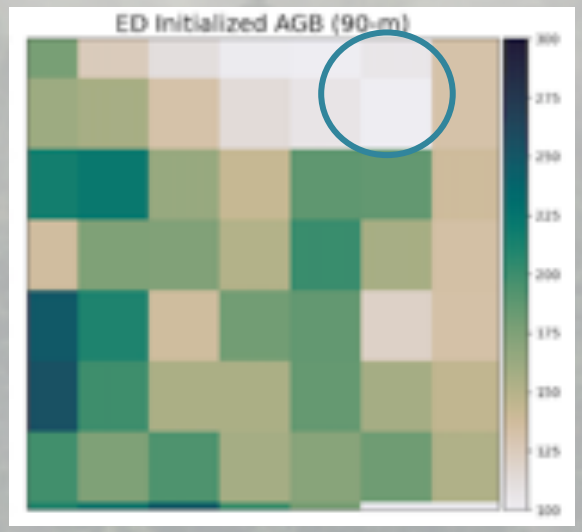


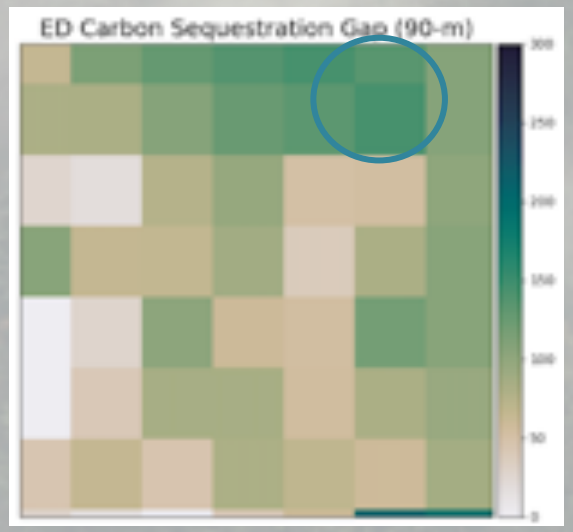


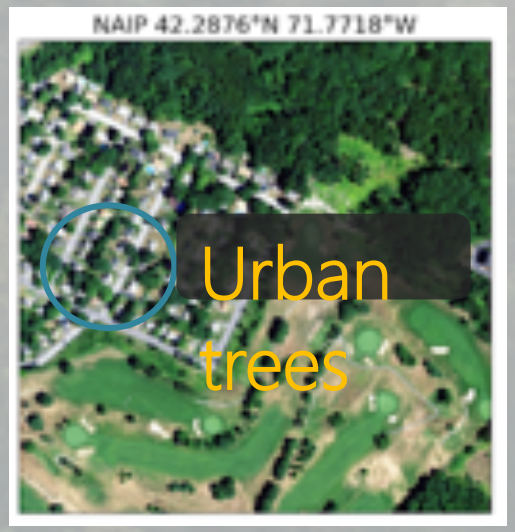
Ma et al., 2021

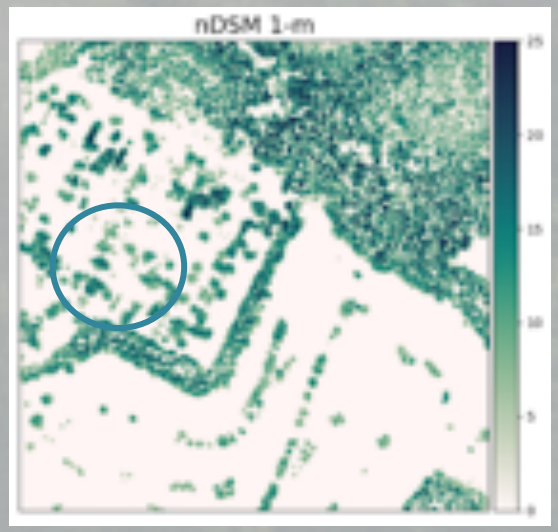
Fine-scale Heterogeneity

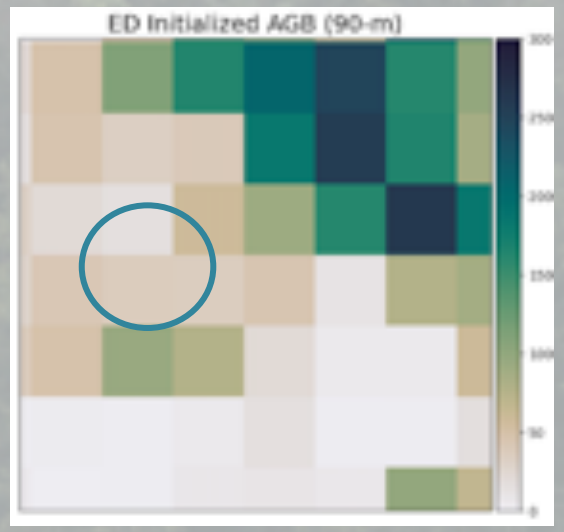


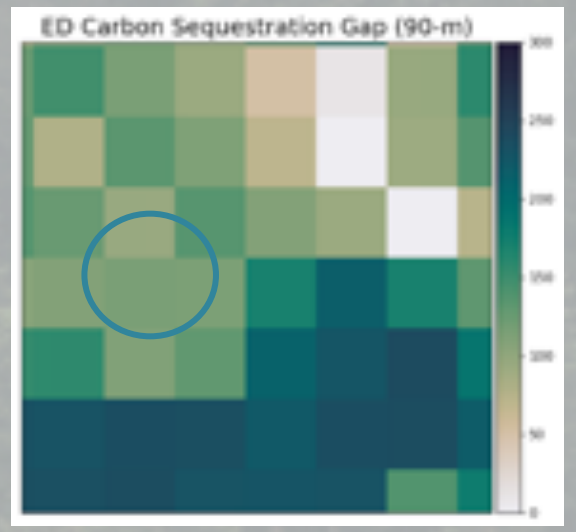








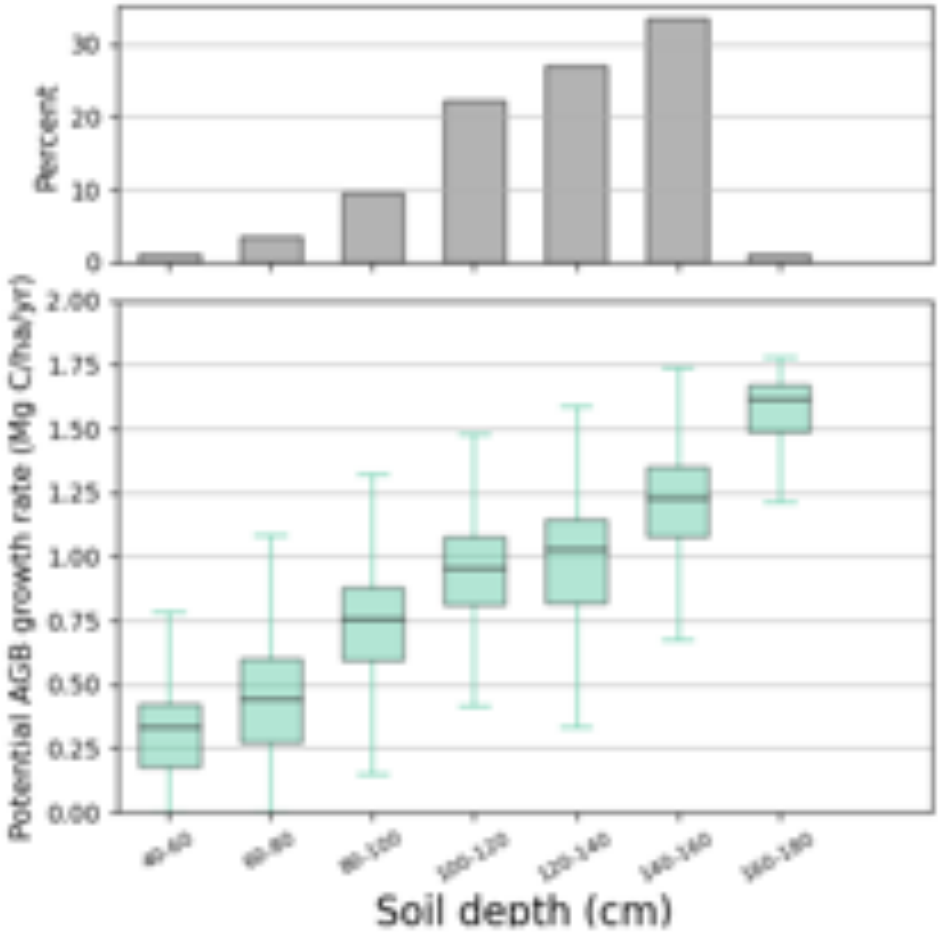


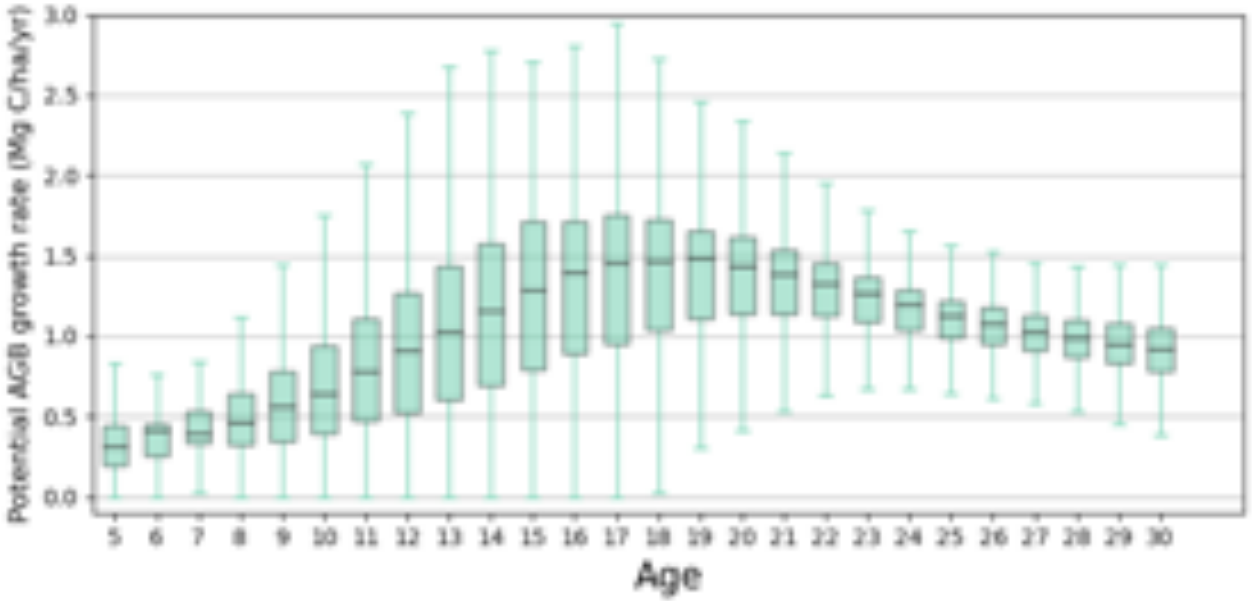


- **AGB growth rate is a function of stand age, soil and climate.**

RGGI avg. reforestation potential:

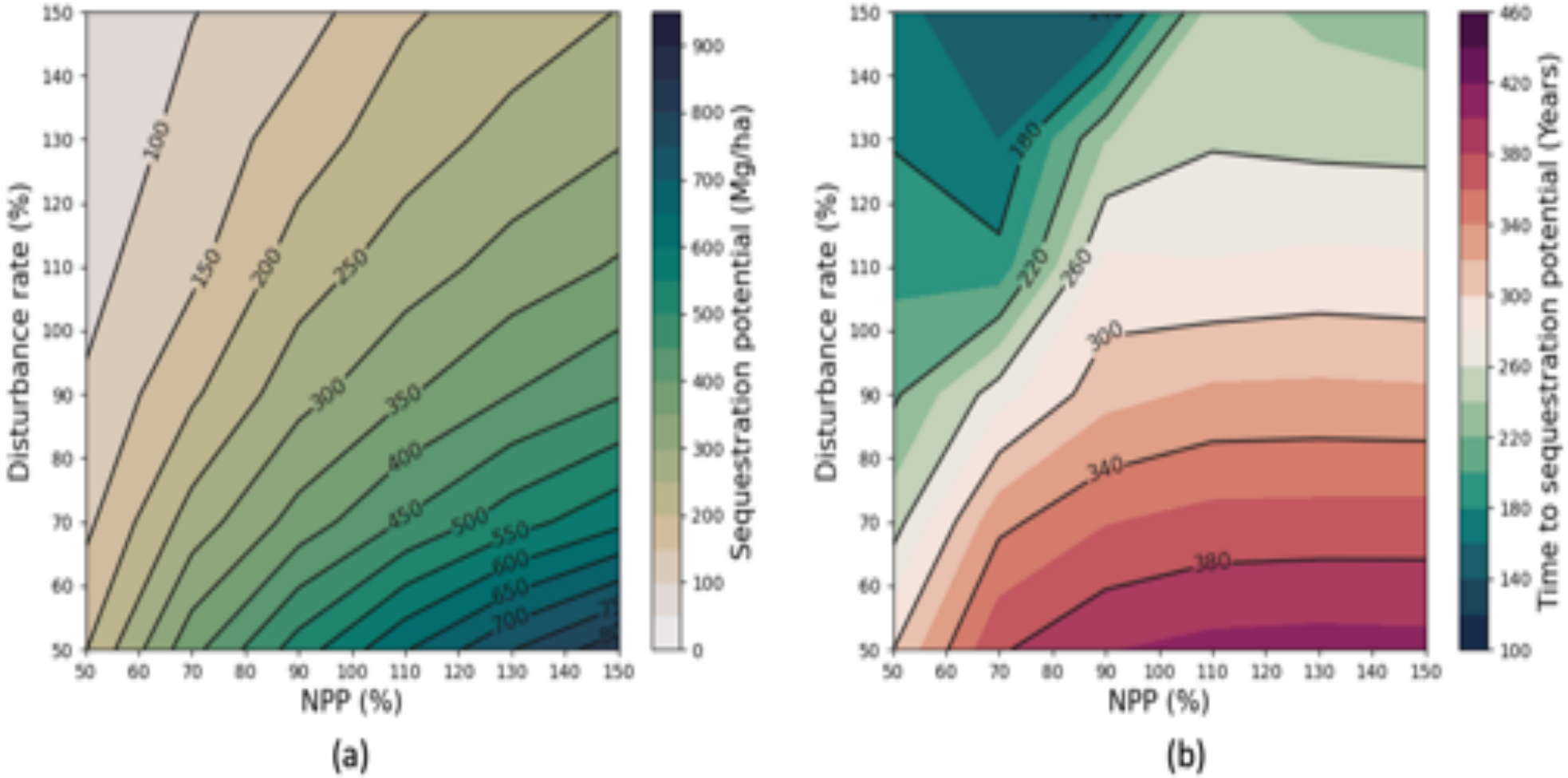
- **1.05 MgC/ha/yr (this study).**
- **0.96 MgC/ha/yr (Cook-Patton et al 2020).**





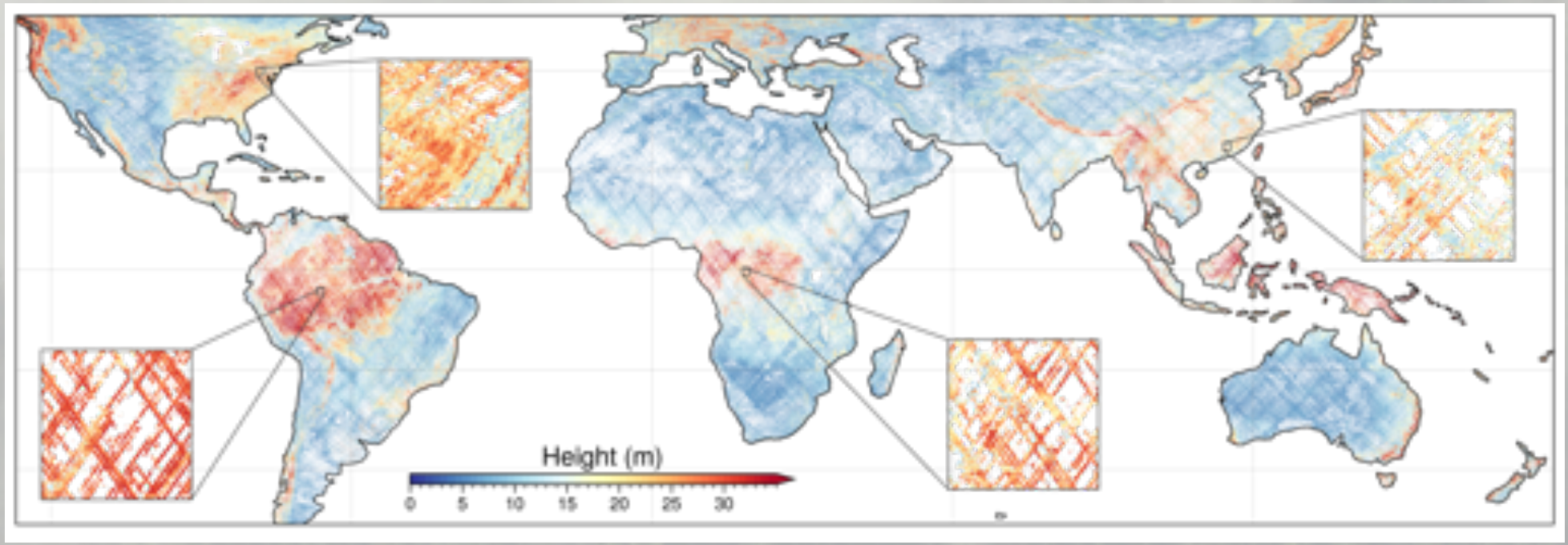
Ma et al. 2021

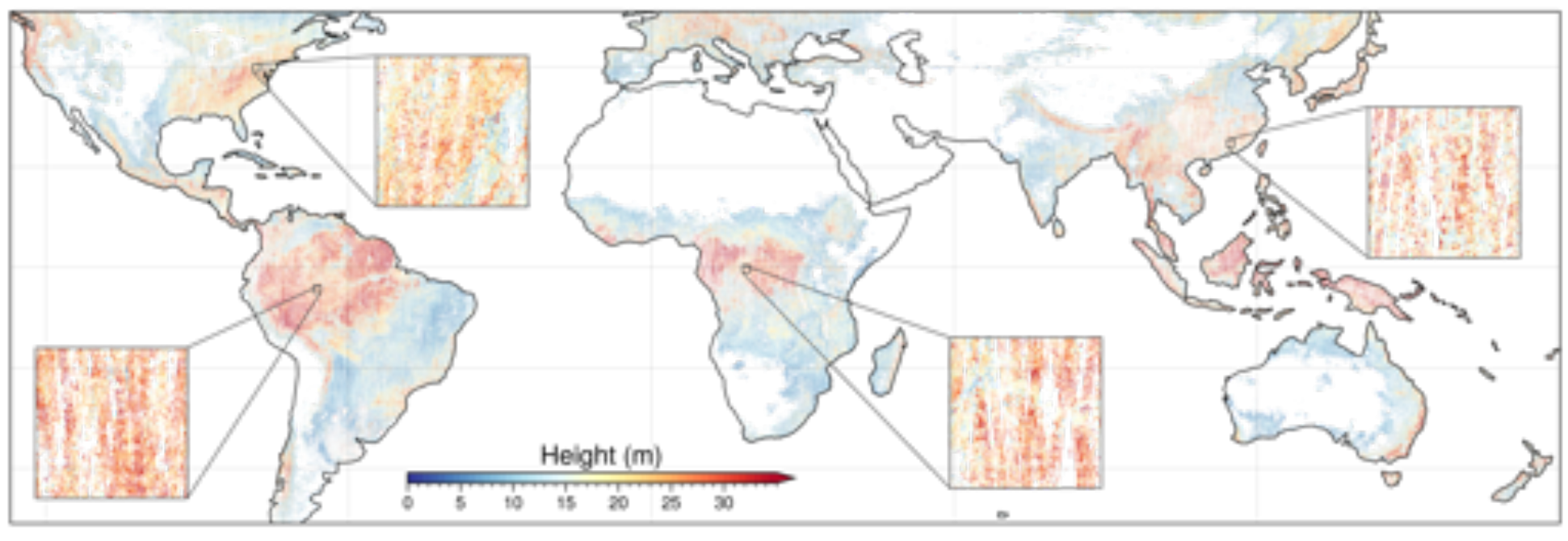
Climate Change Sensitivity



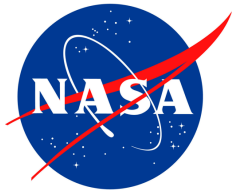
Ma et al. 2021

Gridded GEDI Avg Canopy Height (0.01°)





Gridded ICESat-2 Avg Canopy Height (0.01°)



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Thank you!

The University of Vermont