High-resolution forest carbon modeling for climate mitigation planning over the RGGI region, USA

Science Question
- What are contemporary aboveground carbon stocks and future aboveground carbon sequestration potential over the RGGI region?
- How can ecological modelling and remote sensing (lidar & optical) be integrated to improve regional forest carbon modelling?

Method
Ecosystem modeling (i.e., Ecosystem Demography, ED), high-resolution airborne lidar and NAIP imagery, field data, meteorology, soil properties are combined to develop regional forest carbon modeling system, which provide estimates of aboveground carbon dynamics from present to future at 90 m resolution.

Result/Significance
- High-resolution forest modeling can capture fine-scale heterogeneity and benefit regional planning efforts of climate mitigation.
- Contemporary aboveground carbon stocks and future aboveground carbon sequestration potential gap are estimated to 1,134 Tg C and 1,776 Tg C for states of CT, DE, MD, MA, NH, PA, RI and VT.
- Partition of carbon sequestration between continued growth of existing trees and new afforested/reforested areas varies with states, depending on contemporary conditions.

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