

Synthesis: US Forest Carbon Sink and Disturbance

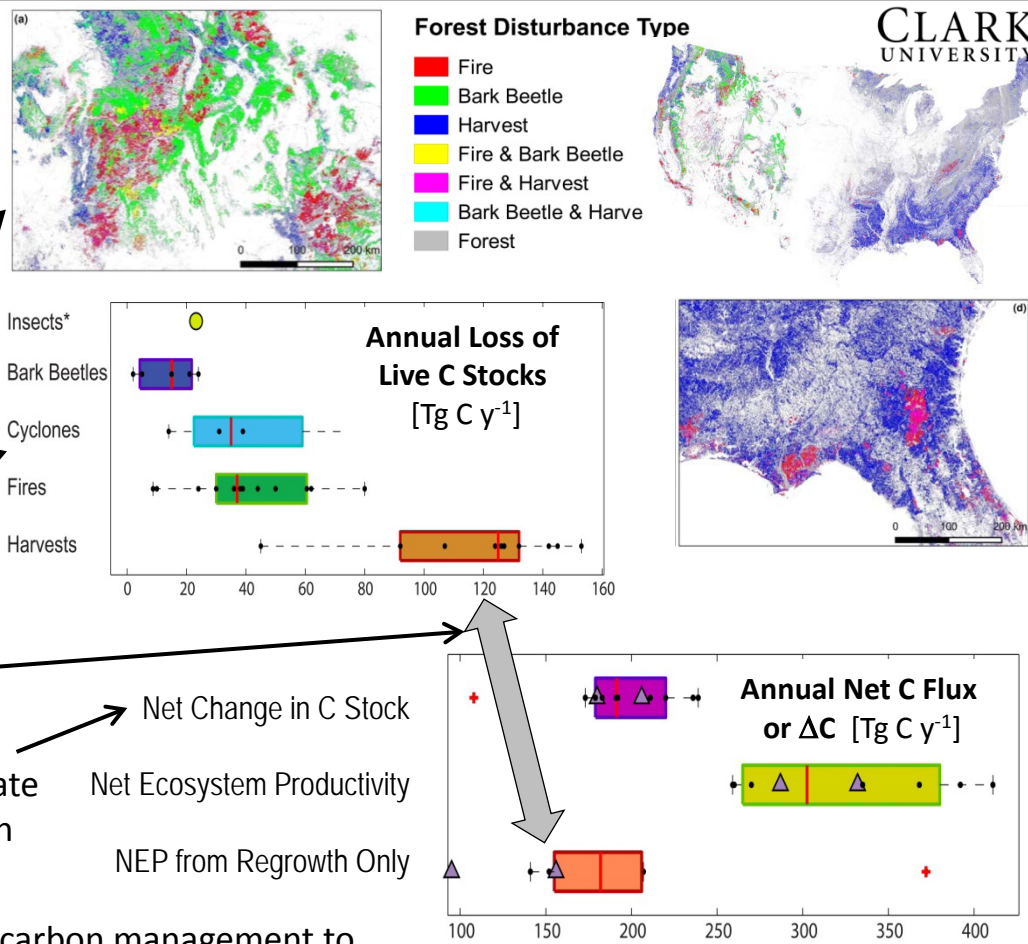
CMS-PI Williams; Williams et al. GPC 2016



Challenge: Quantitative synthesis of US forest carbon losses by disturbances was lacking, particularly comparisons across disturbance types, and consideration of magnitude relative to net increase in forest carbon stocks.

Major Advances:

- 1) Attribution of mapped disturbances to type (harvest, fire, beetle) at 30 m resolution with synthesis of multi-agency satellite and aerial data.
- 2) Compilation across studies indicates carbon losses from disturbances of 200 Tg C annually, led by harvest.
- 3) Model-data syntheses indicate disturbance losses are offset by regrowth.
- 4) This implies that enhanced growth from CO₂, N, climate and other global changes play a major role in the carbon stock increases seen in the US forest inventory.



Significance: Findings underscore opportunities for carbon management to avoid carbon emissions from forest disturbance and to enhance carbon sequestration with forest growth and recovery, while also noting concerns about disturbance trends that are increasing emissions, degrading the overall forest sink, and inhibiting possible carbon emissions offsets by forest management activities.

Williams CA, Gu H, MacLean R, Masek J, Collatz GJ (2016) "Disturbance and the Carbon Balance of US Forests: A Quantitative Review of Impacts from Harvests, Fires, Insects, and Droughts", *Global and Planetary Change*, 143: 66-80, doi:10.1016/j.gloplacha.2016.06.002.