Investigating soil carbon vulnerability and bioenergy sustainability under changing climate

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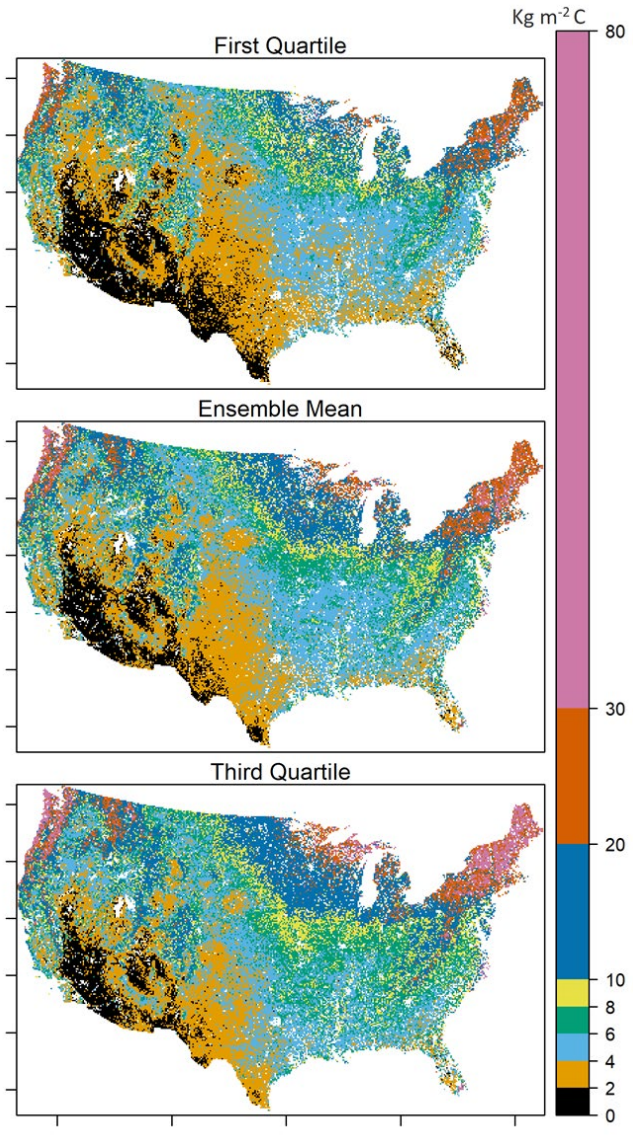
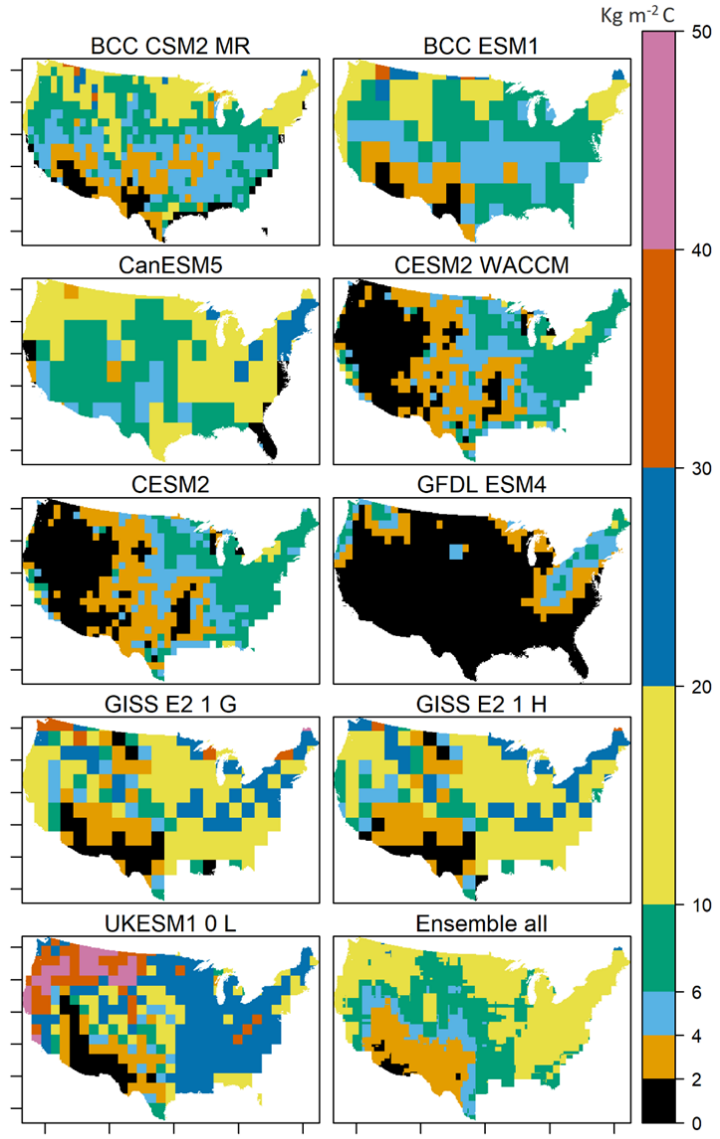
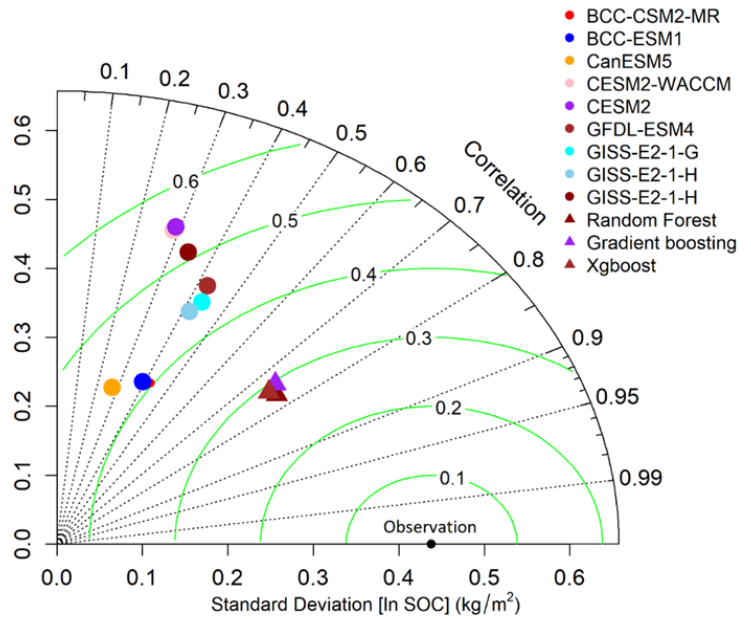
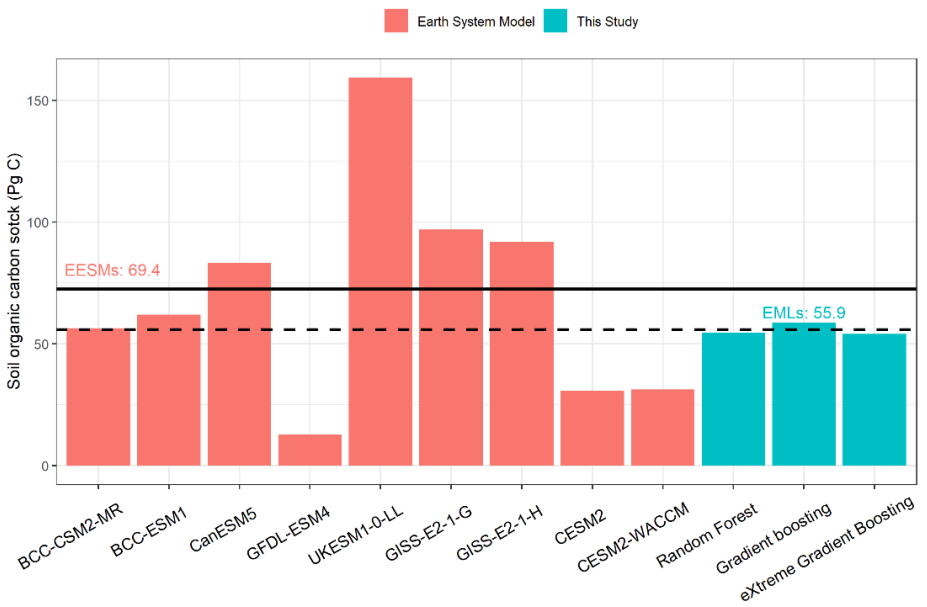
CONTINENTAL US SURFACE SOC STOCKS: MACHINE LEARNING PREDICTIONS IN COMPARISON TO CMIP6 ESM

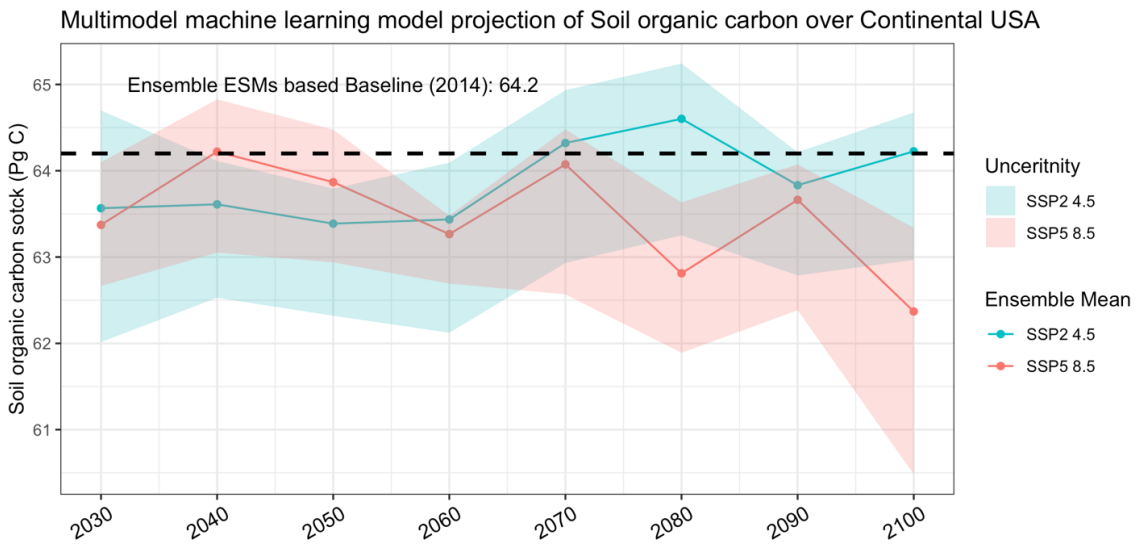


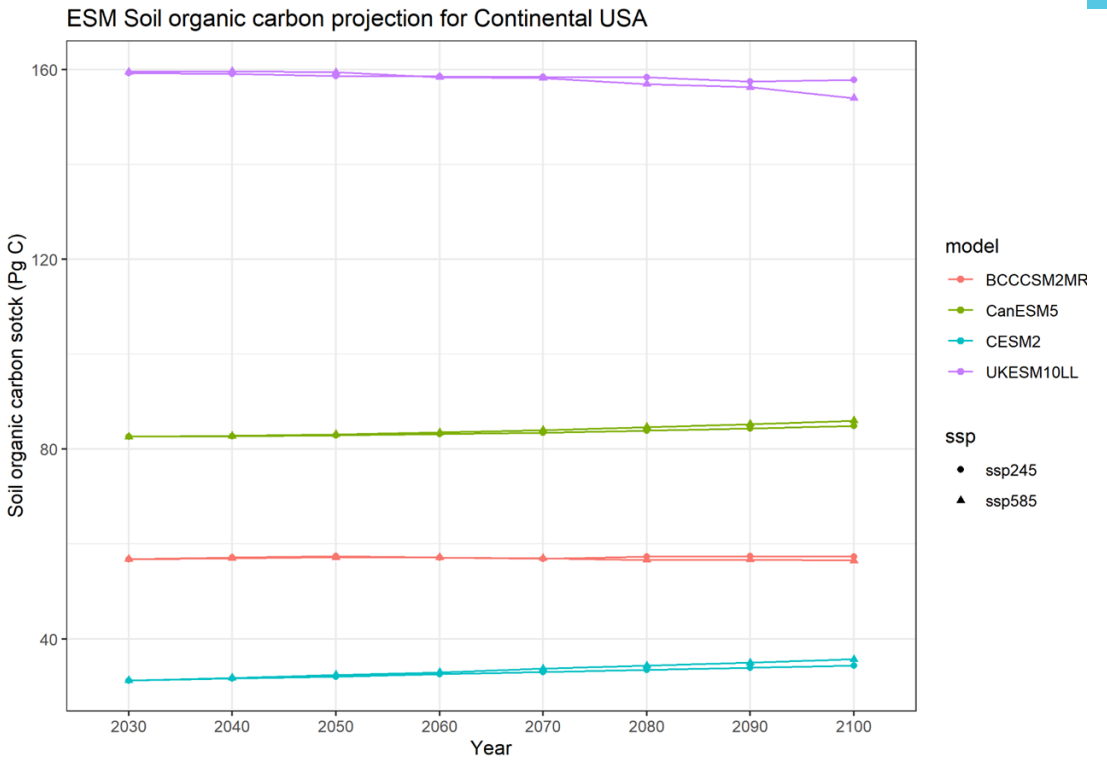


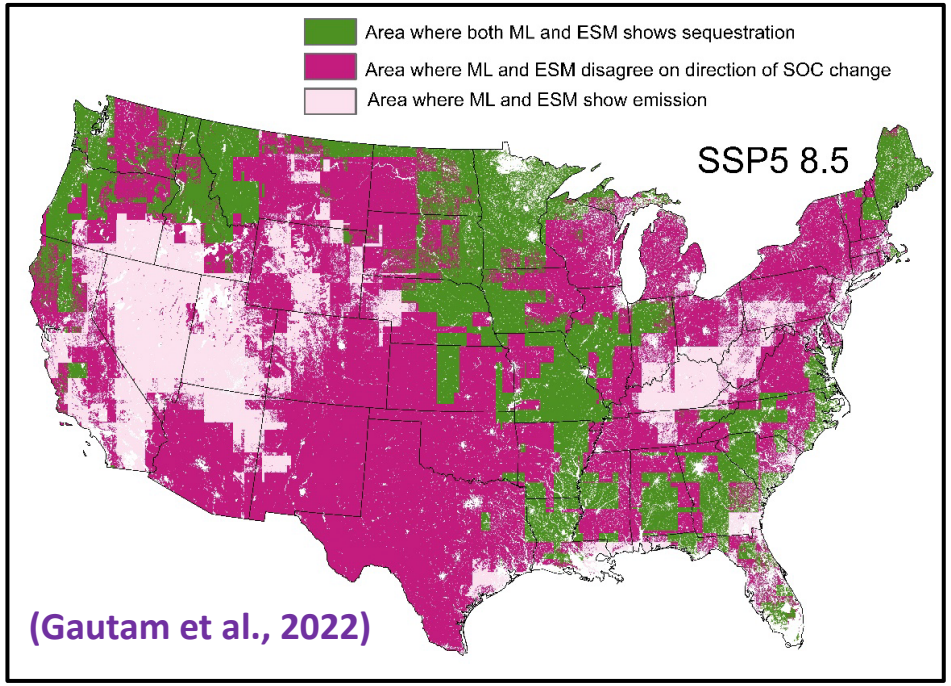




PROJECTED DECADAL SOC CHANGES IN CONTINENTAL US SURFACE SOILS BY 2100

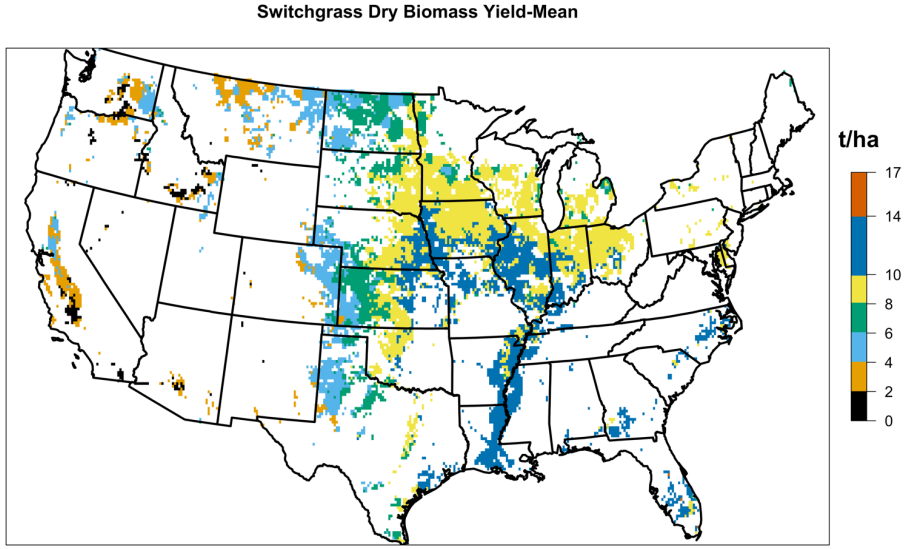


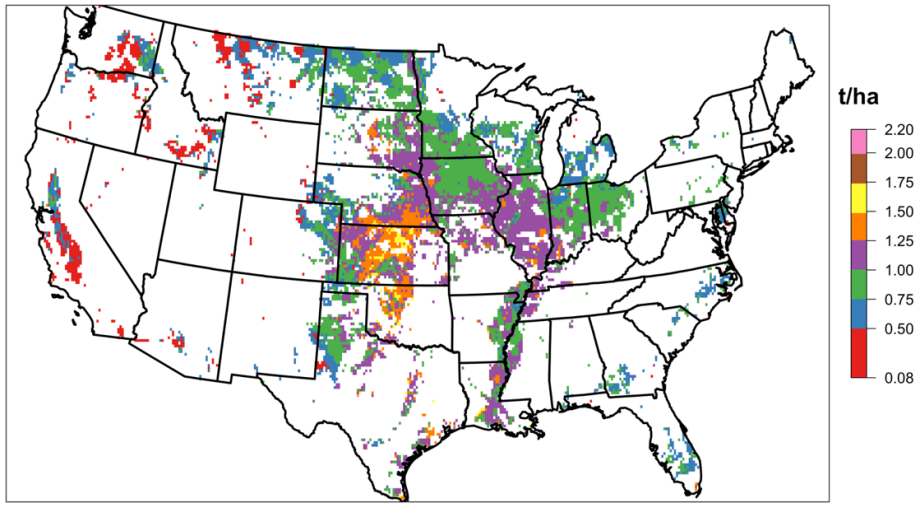


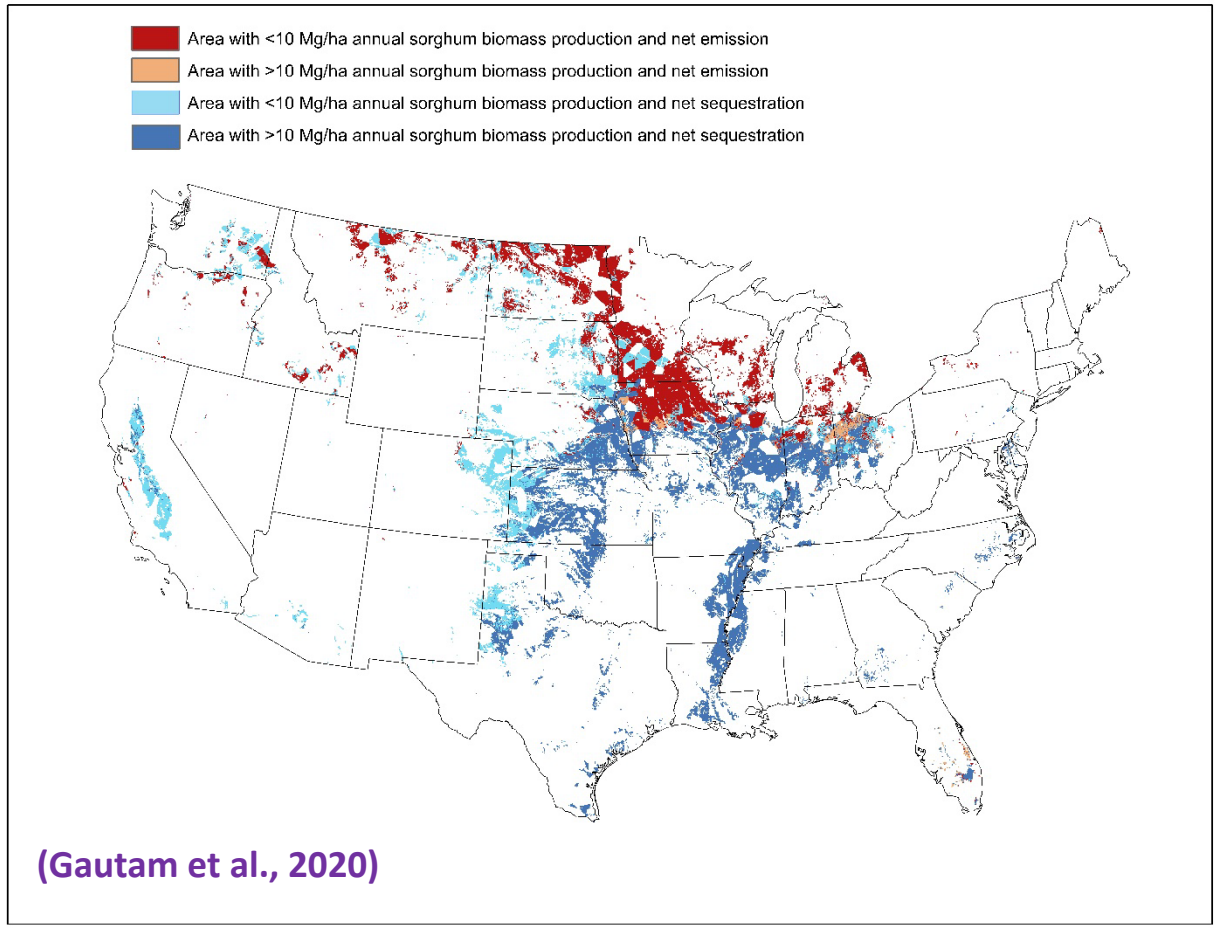


- Ensemble ML approach predicts SOC loss under both moderate (0.56 Pg C) and high emission scenarios (1.8 Pg C). In contrast, ensemble ESMs show relatively no change in continental US SOC stocks.
- Both ML and ESMs predict SOC loss from croplands and wetlands, and agree on the direction of SOC change (net emissions or sequestration) across 43%–47% of continental U.S. land area.

BIOMASS CULTIVATION WILL HAVE SOIL AND SITE-SPECIFIC IMPACTS ON SOIL ORGANIC CARBON







(Gautam et al., 2020)