Socioeconomic

Land Use Change
Changes in forest land use impact the size of the forest C sink. Gains in forestland area should result in an increased C sink, c.p. Increased urbanization could result in forest loss, but could also result in abandonment of rural or suburban land to be used as forests.

Population Growth
Higher population would increase C sink through the increased demand of forest products, but can decrease the sink due to a potential increase in the need for developed and agricultural land.

Trade
If countries trend towards more nationalist attitudes, overall trade will be restricted in all sectors, including the forest product industry. Since much of the timber industry involves multinational trade, this would result in lowered global demand for and production of wood products, reducing the overall global C sink.

Policy
Many types of policies, depending on how they are structured, can impact the global levels of forest C– including those in the agricultural, energy, and industry sectors. Reducing agricultural subsidies will make crop production less profitable, making forest expansion more attractive to landowners. Policies aimed at increasing solar power could result in expansion of solar farms instead of forests, whereas targets to increase renewable energy sources will make pellet production more profitable. Additionally, wood products are a possible option for efforts aiming to replace energy-intensive building materials.

Global Inequity
With larger levels of inequality, we would see an increased C sink in the wealthy countries producing wood products. However, without proper policy and ecological protections in less-developed countries, their forests are at risk from the changing temperatures and deforestation.

Management

Land Rents
Impacts of land use change depend on the cost of forestland relative to other land use types. Areas with high land rents (urban, agricultural) are unlikely to experience afforestation or reforestation, making them unlikely candidates for forest C policy. A piece of agricultural land with low productivity is a better target for forest C policy due to the low cost of land use change.

Management Costs
If the costs of forest management continue to decrease, production of timber products is more profitable and will create a larger global C sink. Alternatively, if management becomes more costly due to fire and disease risk, for example, the associated uncertainty makes forest management less attractive to landowners or potential investors.

Technology
There have been great improvements in genetic, chemical, and machine technology resulting in lower costs associated with forest management. These improvements have increased productivity of forestland, with trees being larger and faster growing than ever, resulting in higher levels of C storage. Increased productivity of food crops can also result in a reduced need for agricultural land to produce the same amount of food.

Markets
Growth in demand for wood products is expected as the global population and quality of life continues to improve, but this population growth may also lead to deforestation for development or agricultural production. Additionally, low production costs are paired with high prices, landowners are likely to manage land for forest products. Alternatively, over-production of timber products could lead to market saturation, making prices lower and causing supply to overwhelm demand for timber products.

Policy The incentive structures of forest C policies will heavily impact the way that forests are managed and, thus, the magnitude of the global forest C sink. For example, if resources are used to grow or preserve forests, discouraging any kind of harvest, there will be minimal C impacts, although environmental benefits would still exist. However, if there are policies encouraging timber products to replace high-emitting energy or building materials, the C sink would grow significantly. **Risk** Given the increase in disturbances, uncertainty about government intervention in climate change, and quickly changing local, national, and global timber markets, there is growing potential for loss of forest and, thus, profits to landowners. With these changes and uncertainties, forest management may be seen as too risky for landowners, preventing them from participating in forest ownership at all. For remaining forest landowners, preparing for disturbances could mean decisions such as changes in species makeup (more fire or drought resistant) or thinning practices (reduced fuel load), both of which would change both the on-site C and off-site wood product pool.
Ecosystem
Wildfire Wildfires are sources of C emissions and increased frequency of fires have impacted productivity of forests significantly. **Deforestation** Deforestation or removing live biomass causes loss of above ground C stored in the forest ecosystems and affects the long-term ecosystem services. **Drought** Droughts increase the mortality rate and reduce the growth rate and productivity of trees in forest ecosystems. **Pests and Pathogen** Pests and pathogen outbreaks are important disturbance drivers influencing mortality, changes in forest structure and composition and ecosystem processes. **Changing temperatures** Rising temperatures and extreme weather conditions directly impact forests by increasing the mortality rate and indirectly by influencing intensity and frequency of other climate induced disturbances. **CO2 levels** A few studies projected that elevated co2 concentrations in the atmosphere increased forest growth during a short term, but long-term effects are to be studied. The indirect impact of elevated co2 concentrations in the atmosphere is a rise in temperatures causing climate change. **Biodiversity** Ecosystem biodiversity and integrity are essential in building resilience to natural disturbances, environmental stresses and improving ecosystem productivity.

Table 1: Socioeconomic, management, and ecosystem drivers of forest carbon storage