

EFFECT OF REFORESTATION ON PRECIPITATION EVENTS

Allyson Clark

Project Overview



- Land cover in the Northeastern United States has changed in time
- Decrease in agricultural land, changes in the timber industry, growth of cities
- How does this affect precipitation events?

Effects of Land Use on Precipitation



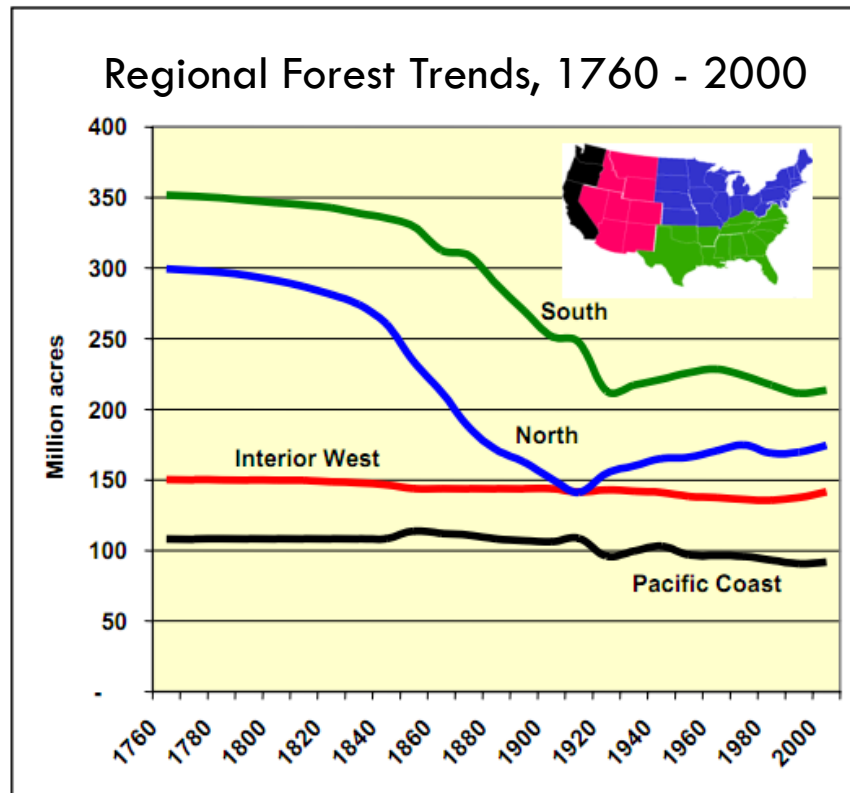
- Land cover can change precipitation by altering ground fluxes and air properties.
- Deforestation can alter the terrestrial carbon budget
- Native Plants versus Agriculture (Israel, Australia)
- Urban heat island
 - ▣ Increases summer precipitation downwind and over major cities

Mid Latitude Forests



- Mid latitude forest systems are more complex compared to the tropics
- Forest coverage change non-linearly
- Modeling studies (such as Baidya Roy et al.) have shown similar effects on precipitation and surface temperatures due to changing forest cover in the mid latitudes
- Seasonality

Reforestation in the Northeast



- Poor timberland management and insect infestations decimated forest populations pre-1920s
- 1928 – McSweeney-McNary Law

Source: <http://www.fia.fs.fed.us/>

Data



- Focused on eight northeastern states
- Time period restricted to summer months
- Rain gauge, temperature data from 1950s-present
 - ▣ Collected from the NCDC
 - ▣ Pre-1950s data has inconsistent coverage
- Forest coverage from historical National Forest Service Reports
 - ▣ Statistical surveys

Model



- Three five-year simulations of CMMAP global climate model run
- Each simulation had different ground covering in Northeast United States
- Compare changes in precipitation, temperature between simulations to observations

Pennsylvania – Forest Change

Dark Green	> 1.0
Medium Green	0.75 - 1.0
Light Green	0.50 - 0.74
Yellow-Green	0.25 - 0.49
Yellow	0.01 - 0.24
White	0
Light Blue	-0.01 - -0.24
Medium Blue	-0.25 - -0.49
Dark Blue	-0.50 - -0.74
Very Dark Blue	-0.75 - -1.0
Dark Blue	< -1.0

