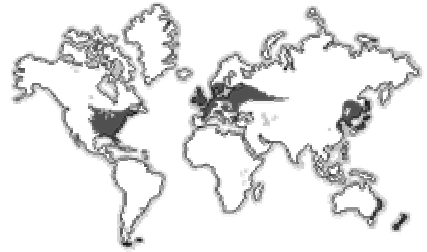
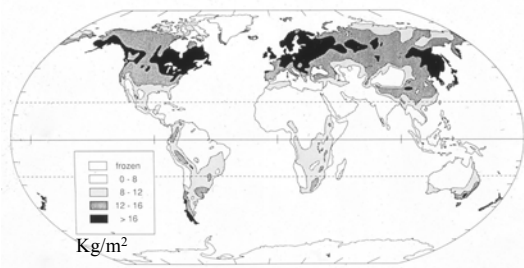


## *Deciduous Forest Biome*

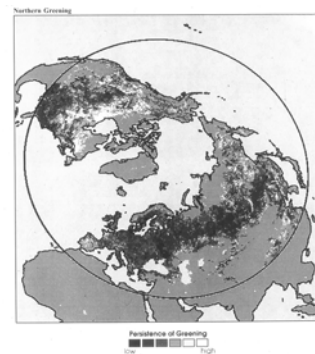
## *World Distribution Of Deciduous Forests*



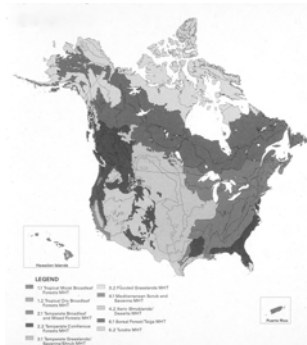
## *Soil Carbon (undisturbed)*



## *Persistence Of Greening*



## *Major Forest Types Of North America*



## *UN/FAO Soils Map of the U.S.* *Soils Ranked by PCC Limiting Factors*





*The Largest Living Thing On Earth (above ground)*

Major Sherman Redwood  
Sequoia National Park  
Kings River Canyon, California

Height above base - 274.9 ft.  
Circumference at ground - 102.6 ft.  
Weight - 6,000 tons  
Age - 2,000 yrs

This block contains two photographs of the Major Sherman Redwood tree. The left photo shows the tree's massive trunk and canopy, while the right photo is a closer view of the trunk. Text to the right of the photos provides key statistics about the tree.

*World's Largest Trees*  
*Only 2,000 Years Old!*

General Sherman Redwood: 6,000 tonnes

This block features a photograph of the General Sherman Redwood tree, a massive sequoia. Below the photo is a caption identifying the tree and its weight.

*Land Of The Ancient Ones*

**Distribution of the Bristlecone Pine**

● Pinus longaeva ● Pinus aristata

A map of the western United States showing the distribution of two types of bristlecone pines. The map is divided into states: Nevada, Utah, Colorado, California, Arizona, and New Mexico. Black dots indicate the locations of Pinus longaeva, and black squares indicate the locations of Pinus aristata. A legend at the bottom identifies the symbols.

# *The Methusala Ridge*

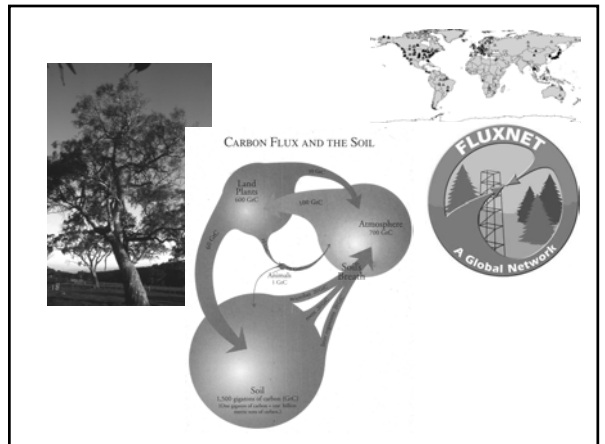
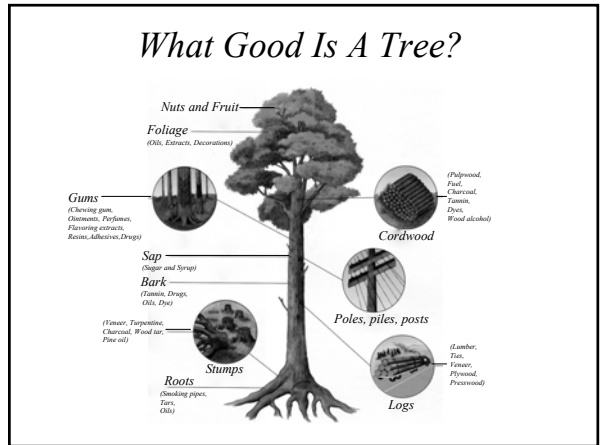
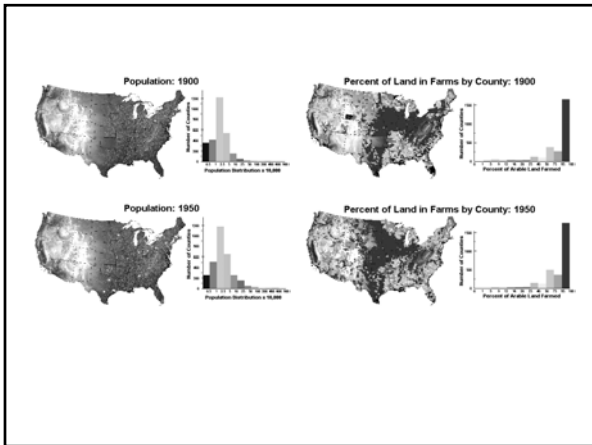
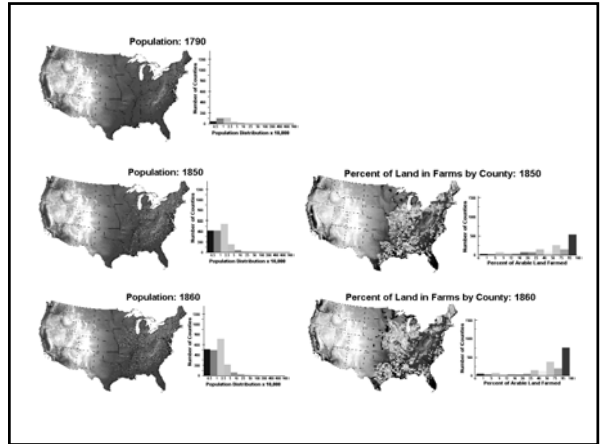
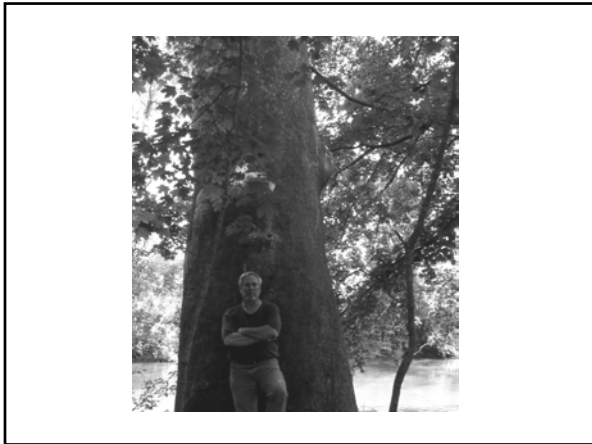


Wheeler, Arizona In the White Mountains



*Champion Trees  
of Washington State*

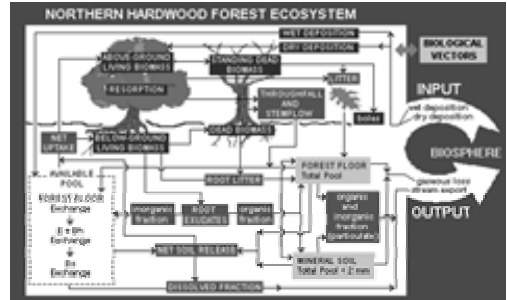




# Evapotranspiration



# Summary Of Forest Ecosystem Functions

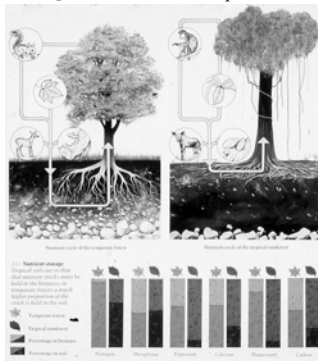


## Temperate Zone      Tropical Zone

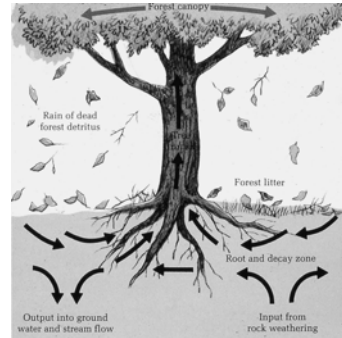
Canopy Relationships

Soil and Root Systems

Nutrients and Soil Types

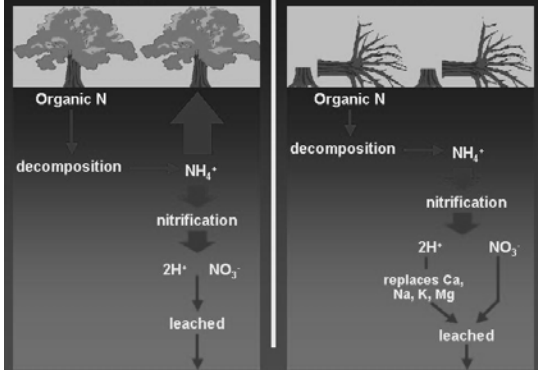


# Seasonal Recycling



## Forest

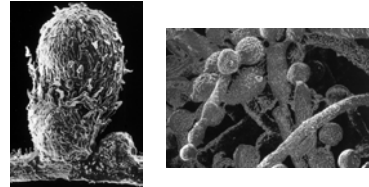
## Cut



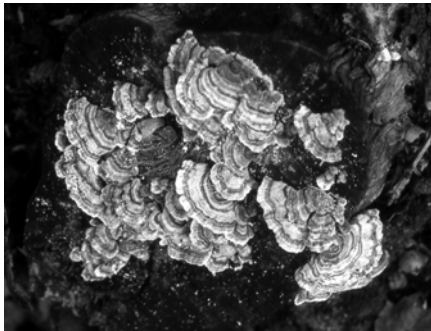
*Ants Play A Major Role In Recycling Nutrients*



Micorrhiza Connect One Tree To Another Creating Forest Communes



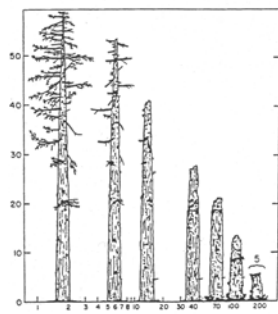
*Nutrient Recycling*



*Nutrient Recycling*



*Trees Represent Long Term Carbon Sequestration*



Decomposition of a Dead Douglas-fir

*Clearcut Forest*





## Sometimes Things Do Get Better

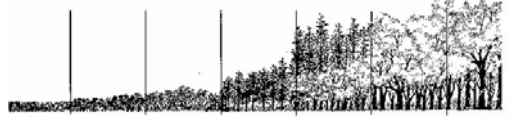
17th Century Pastoral Painting



The Way It Looks Today



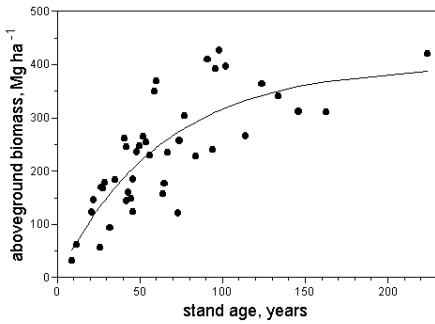
## Plant Succession In An Old Field



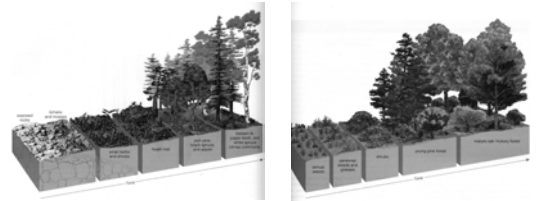
1st Year Herbweed dominant, Cultgrass, pigweed	2nd Year Asters dominant, Cultgrass	3rd to 18th Year Grass scrub community; Bromus-like grass; Pines coming in ditto stage	19th to 30th Year Young pine forest	30th to 70th Year Mature pine forest; Understory of young hardwoods	70th to 100th Year Pine to hardwood transition	100th Year Climate oak-hickory forest
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Duke University School Of Forestry

## Forest Maturation And Productivity



## Plant Succession In Two Different Forest Communities

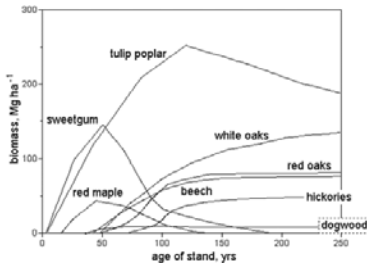


Primary Succession

Secondary Succession

From: *Living In The Environment*  
G.E. Miller  
1996

## Succession In A Hard Wood Forest



## Soil Microbes And Ecozones

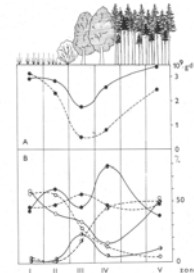
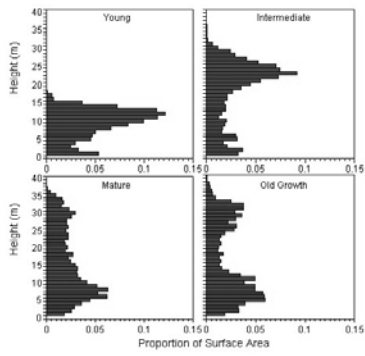


Figure 9.2. Distribution of bacteria (B), actinomycetes (A), and microfungi (F) through the zones of a grassland open-forest ecotone near Leroux, Czechoslovakia, in the homes (—) and mineral (---) biomes, on March 19, 1986 (after Kozlák, unpublished data). (A) biomass (light = grams of dry weight), (B) relative density of soil microorganisms in %.

### Succession In A Hard Wood Forest

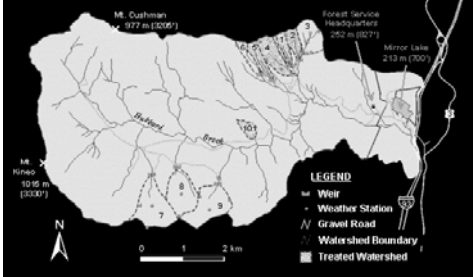


### INSTITUTE OF ECOSYSTEM STUDIES

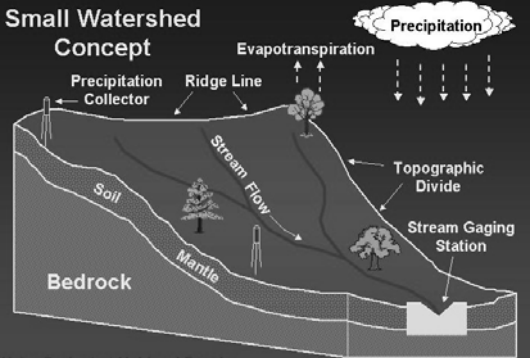


### Hubbard Brook Experimental Forest

West Thornton, New Hampshire



### Small Watershed Concept



Water Budget at Hubbard Brook:  
 Precipitation (100%) = Streamflow (60%) + Evapotranspiration (40%)

### Watershed 5,4 & 2



Hubbard Brook

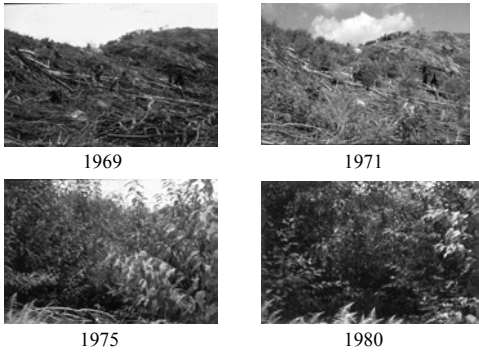
### Watershed 5



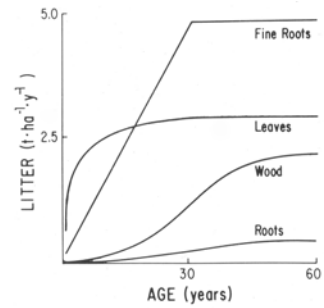
Hubbard Brook



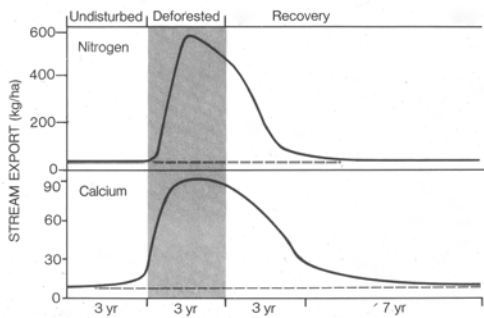
### Clear Cut To Recovery



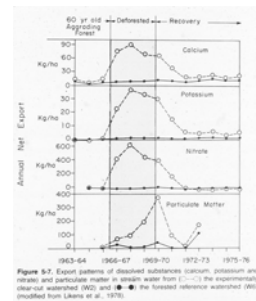
### Sources Of Litter Years After Cutting



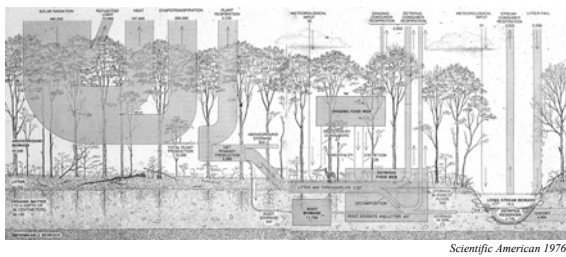
### Hubbard Brook Project



### Summary Of Hubbard Brook Experiment



### Summary Of Hubbard Brook 1976



### Resiliency



# Threats To The Forest

*Fire*

*Climate Change*

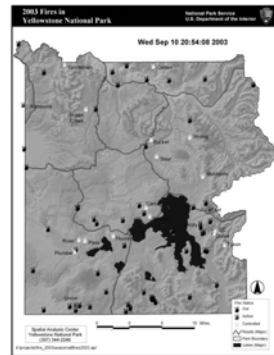
*Over-harvesting*

*Acid Deposition*

*Fragmentation And Encroachment*



*Fire!!*



## *Yellowstone Park Fire Of 1988*

*30% Of The Park Burned To The Ground*



## Extinguish Or Let It Burn?



## Burn Baby, Burn!



*What Is It Like Today?*

Awesome!



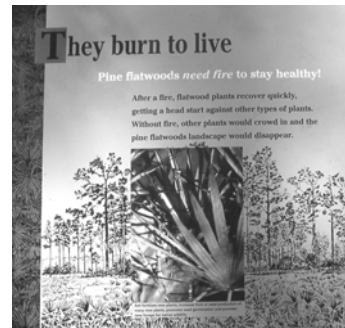
Plant Succession



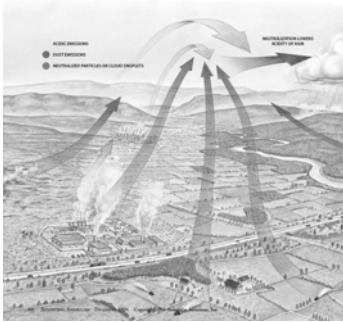
Really Awesome!



*The Role Of Fire In Ecological Process*



## Acid Rain And Deposition



## Deforestation-Reforestation

The George Washington National Forest, now a national treasure, was once "the land nobody wanted". It was formed as a result of the Weeks Law of 1911, which authorized the purchase or exchange of private lands, primarily in the east. Its original intent was to protect water and water supplies that had been damaged by abuse during the earlier settlement and industrial period.

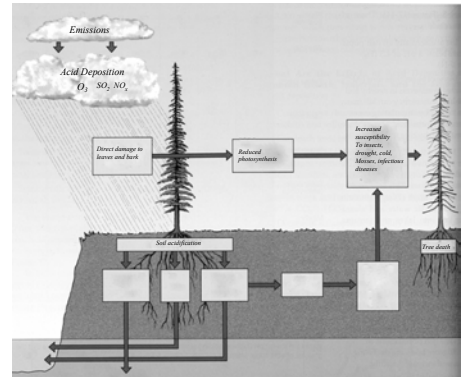
## SHENANDOAH NATIONAL PARK



## Forest Damage Due To Acid Rain



## Effects Of Acid Deposition On Trees



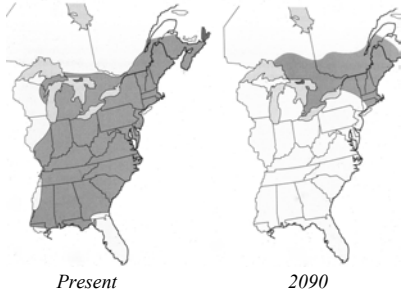
From: G. T. Miller, *Living In The Environment*, 2004

## Clearcut Forest



## Climate Change

*Climate Change And Distribution of Forests*



*Fragmentation Creates Ecotones*



*Leave It To Beaver*



*Kudzo Takeover*



*If We Leave It Alone, The Forest  
Will Regenerate All By Itself*

