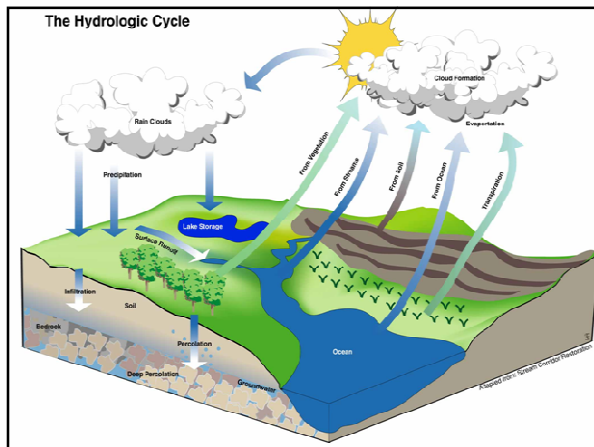
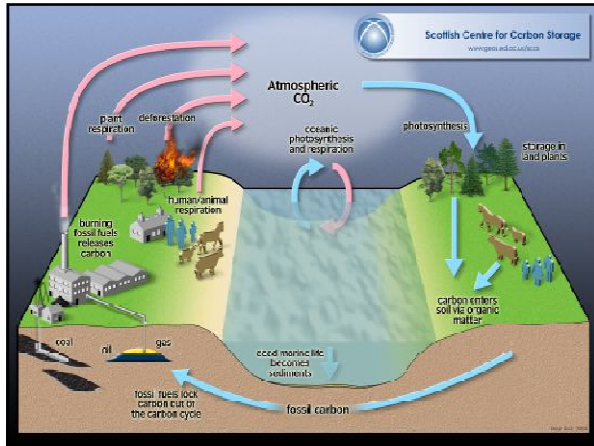
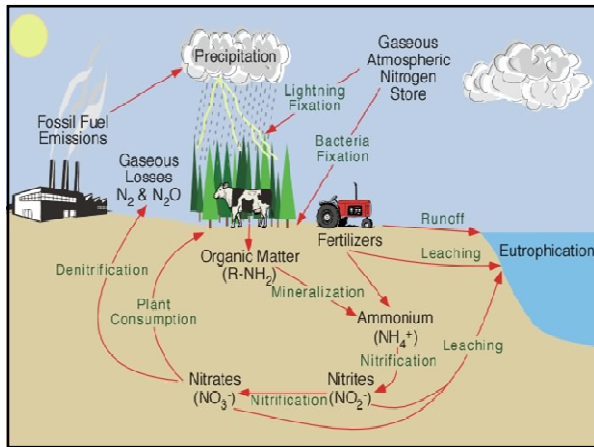


Water, Watersheds, Woodlands

- Basic natural cycles:
 - Hydrologic: movement of water
 - Carbon: linked to bioavailable energy
 - Nitrogen, phosphorus, trace elements
- There are many such cycles. Any ecosystem, such as woodlands, is involved in all of them all at once.








Woodlands in the Prairie Region

- From southeast to northwest in Iowa, the proportion of wooded surface decreased prior to settlement & generally does so today
 - Number of native species also declines SE to NW
- Iowa's wooded surface:
 - 2.1 million acres, 5.7% of the land surface
 - At time of settlement, 12 to 20%
 - Located mainly along major rivers, perennial streams, some ephemeral streams



The Structure of Woodlands

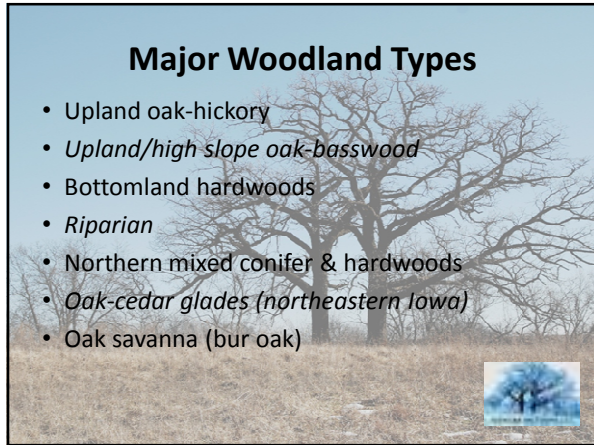


- Canopy trees
- Understory trees: saplings, a few mature species
- Vines
- Shrubs: sparse or absent in Iowa
- Herbaceous or non-woody plants
- Soil organisms



Major Woodland Types

- Upland oak-hickory
- *Upland/high slope oak-basswood*
- Bottomland hardwoods
- *Riparian*
- Northern mixed conifer & hardwoods
- *Oak-cedar glades (northeastern Iowa)*
- Oak savanna (bur oak)




Upland Oak-Hickory

- *Topographical position*: dry uplands on south- & west-facing slopes
- *Dominant canopy trees*
 - White, black, bur oaks
 - Shagbark hickory
 - White ash
 - Black cherry
- *Understory*
 - Ironwood, chokecherry, hackberry, red mulberry, American elm, red or slippery elm




- *Shrubs*
 - Nannyberry, prickly ash, gooseberry, hazelnut, smooth sumac, gray & red-osier dogwoods, bladdernut, brambles
- *Herbaceous*
 - *Carex* sedges
 - Great Solomon's-seal
 - Flexible & elm-leaved goldenrods
 - Bedstraws
 - Wood anemone
 - Spring beauty, dogtooth violet, Canada & birdsfoot violet, liverleaf (hepatica), wild ginger, bloodroot, Dutchman's breeches



- *Vines*
 - Virginia creeper
 - Fox & river grapes
 - Poison ivy
 - Greenbrier

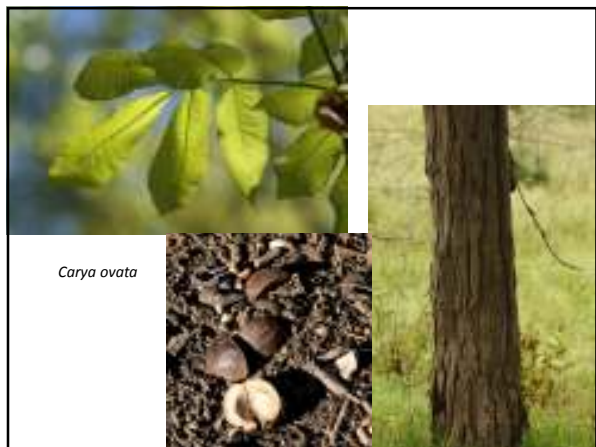




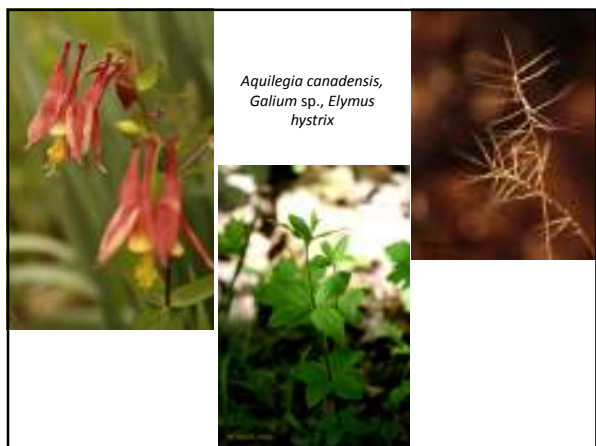
Quercus alba



Quercus macrocarpa



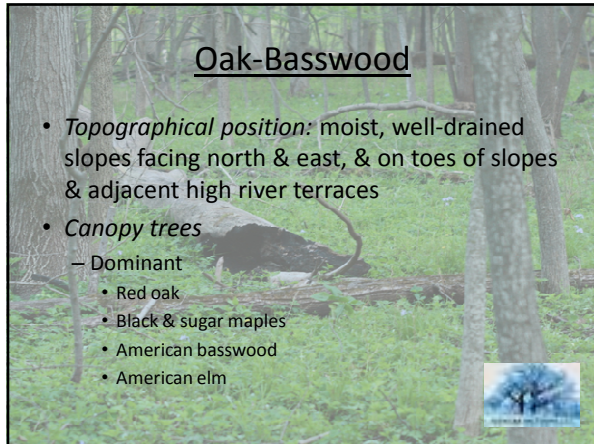
Carya ovata



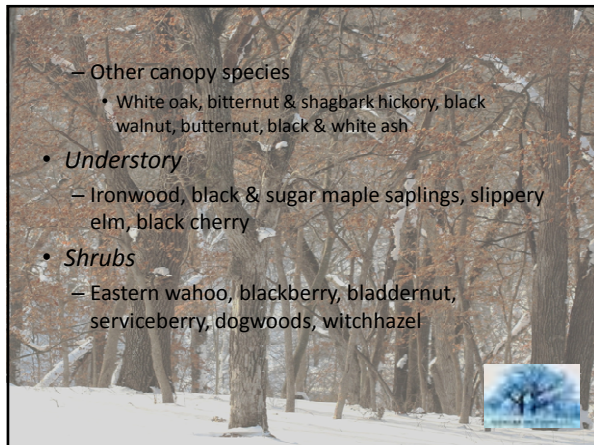
Aquilegia canadensis,
Galium sp., *Elymus*
hystrix

Oak-Basswood

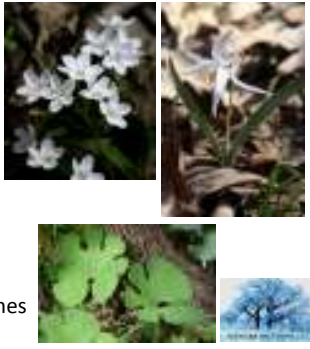
- *Topographical position*: moist, well-drained slopes facing north & east, & on toes of slopes & adjacent high river terraces
- *Canopy trees*
 - Dominant
 - Red oak
 - Black & sugar maples
 - American basswood
 - American elm



- Other canopy species
 - White oak, bitternut & shagbark hickory, black walnut, butternut, black & white ash
- *Understory*
 - Ironwood, black & sugar maple saplings, slippery elm, black cherry
- *Shrubs*
 - Eastern wahoo, blackberry, bladdernut, serviceberry, dogwoods, witchhazel



- *Herbaceous*
 - Hepatica
 - Jack-in-the-pulpit
 - False spikenard
 - *Carex* sedges
 - Wild sarsparilla
 - Bloodroot
 - Fragile fern
 - Bishop's cap
 - Dogtooth violet
 - Dutchman's breeches
- Toothwort

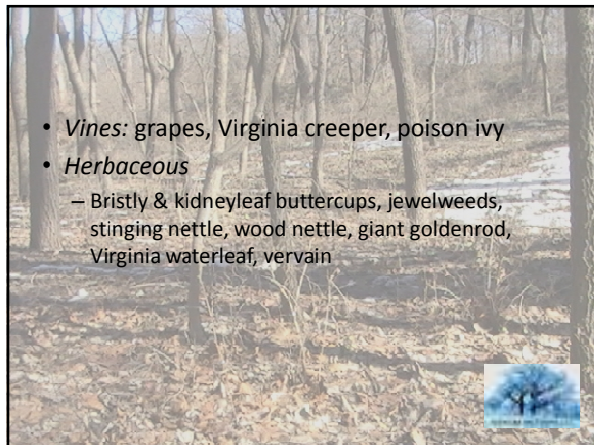
















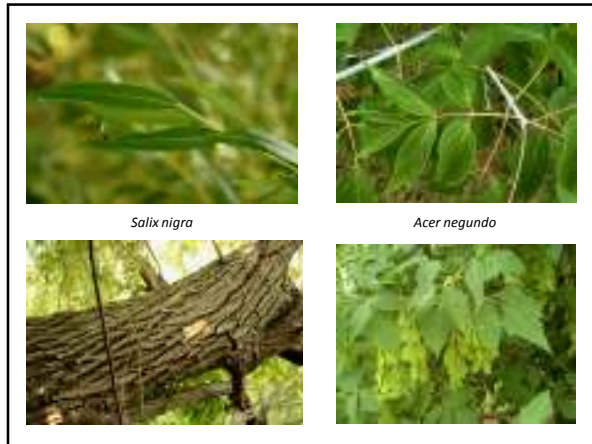
Riparian Forests

- *Topographical position:* low river terraces, mudflats, sandbars, lakeshores
- *Canopy trees:* often large numbers of seedlings & saplings, depending on season & frequency of flooding & flood scouring
 - Eastern cottonwood
 - Silver maple
 - Boxelder
 - Black, peachleaf, & sandbar willows

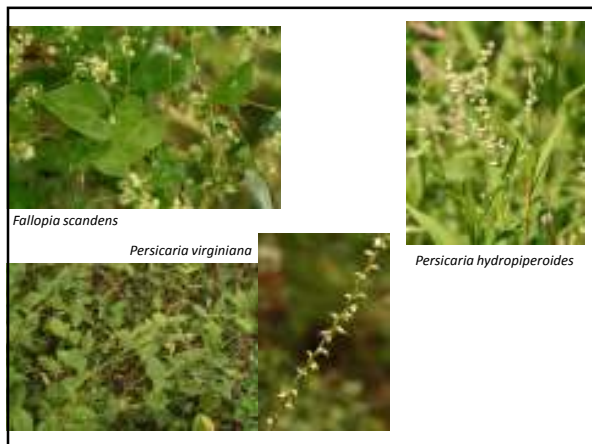


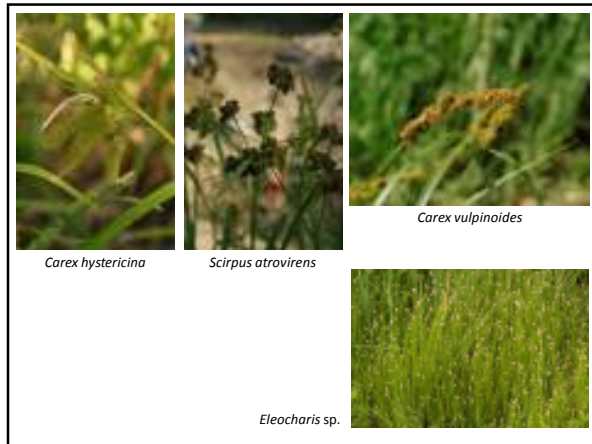
- *Understory*
 - Plum
 - Chokecherry
 - Elms
 - Other willow species
 - Elderberry
- *Herbaceous*
 - Smartweeds: lady's thumb, water, mild water-pepper, dotted
 - Carex sedges
 - Beggar-ticks & stick-tights












Mixed Conifer & Hardwood

- *Topographical & geographical location:*
 Limited to steep north-facing slopes,
 northeastern Iowa: driftless region
 - Oak-basswood canopy species
 - Eastern white pine, balsam fir, paper & yellow birches, mountain maple
 - Speckled alder, Canada yew, highbush cranberry, red elderberry
 - Numerous unusual & rare herbaceous spe



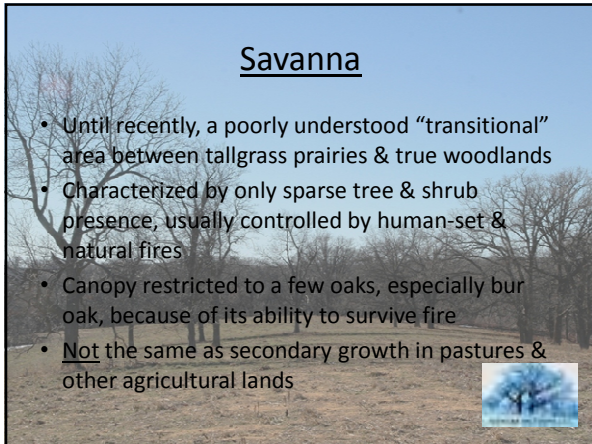
Oak-Cedar Glade

- Found on thin, alkaline soils over limestone bedrock in eastern Iowa
- *Canopy:* chinkapin oak, eastern red-cedar
- *Woods floor:* columbine, serviceberry, black snakeroot, moonseed, bladder fern, sassafras, joe-pye-weeds, flowering spurge, crownbeard





Savanna

- Until recently, a poorly understood “transitional” area between tallgrass prairies & true woodlands
- Characterized by only sparse tree & shrub presence, usually controlled by human-set & natural fires
- Canopy restricted to a few oaks, especially bur oak, because of its ability to survive fire
- Not the same as secondary growth in pastures & other agricultural lands



- *Understory*: adjacent woodland trees & shrubs present as saplings only if fire is infrequent or suppressed
- *Herbaceous*: consists of a mix of species from the adjacent woodland type and open prairie, AND some species adapted to the unique savanna ecosystem





Top row: Campanula americana, Achillea millefolium, Mertensia virginica.
Bottom row: Lobelia siphilitica, Packera plattensis



Resources

- Books
 - Jeanette Thompson, *Prairies, Forests, & Wetlands: The Restoration of Natural Landscape Communities in Iowa* (University of Iowa Press)
 - Cornelia Mutel, *The Emerald Horizon: The History of Nature in Iowa* (Island Press)
 - Rick Darke, *The American Woodland Garden: Capturing the Spirit of the Deciduous Forest* (Timber Press)
 - Peter van der Linden & Donald Farrar, *Forest and Shade Trees of Iowa*, 3rd ed. (Univ. of Iowa Press)

- Seed & cutting sources
 - Diversity Farms
 - (712) 683-5555
 - 25494 320th, Dedham, Iowa 51440
 - E-mail: diversityfarms@iowatelecom.net
 - Iowa State Forest Nursery
 - (800) 865-2477
 - 2404 South Duff Avenue, Ames, Iowa 50010
 - Fax: 515-233-1131
 - Web: www.iowadnr.gov/forestry/nursery.html
 - Tallgrass Prairie Center
 - (319) 273-3005
 - University of Northern Iowa
 - 2412 W 27th Street, Cedar Falls, Iowa 50614
 - Fax: (319) 268-0668
 - Email: gregory.houseal@uni.edu
 - Website: <http://www.iowaecotypeproject.org>
