



Citizen Forester Training

# PLANTING THE RIGHT TREE

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FORESTER ARLINGTON PARKS AND RECREATION

05/16/2018

# OBJECTIVES

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- Build on knowledge of biology to better understand tree selection
- Gain appreciation for native and well-adapted species
- Discuss reasons for tree selection:
  - Beauty and color
  - Size, shade, and benefits
  - Longevity, tolerance, and adaptability

# MAIN FACTORS TO CONSIDER

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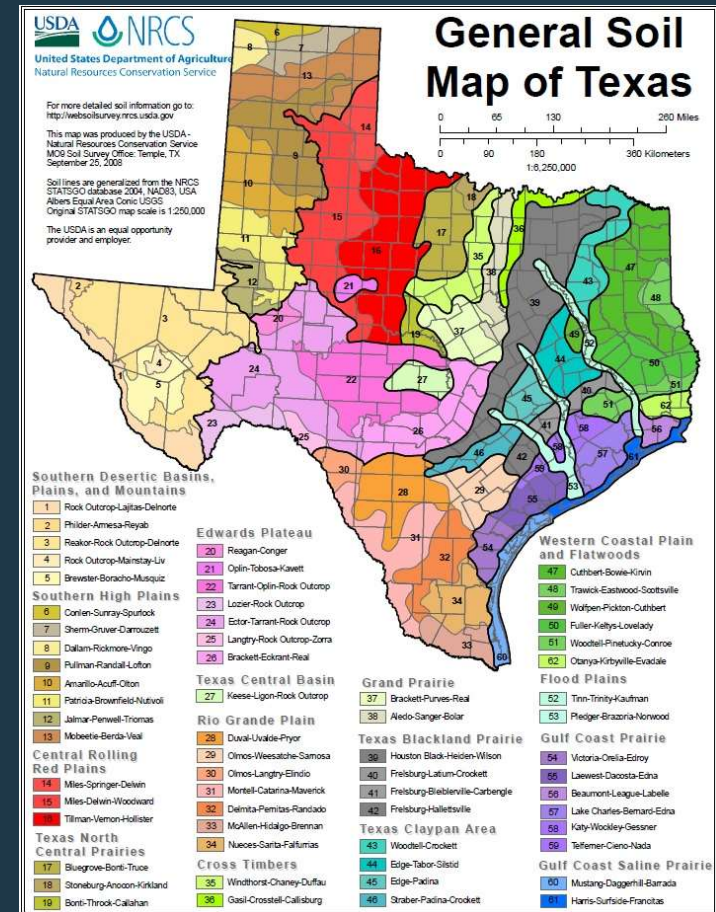


- Soils
  - Cannot realistically be changed
  - Dictate options for species selection
  - Abiotic root cause of many later tree issues
- Climate
  - Consider drought and changing rainfall patterns
  - Less risk with tried and true species
  - Some guides exist (USDA Hardiness Zones), but need to consider all aspects

# SOILS



- pH
  - Below 7.0 is acidic
  - Above 7.0 is alkaline
  - Arlington soils range from about 6 to 8.5 pH
  - The scale is logarithmic (i.e. pH 5 is 10X more acidic than a pH of 6, pH 9 is 10X more alkaline than pH of 8)



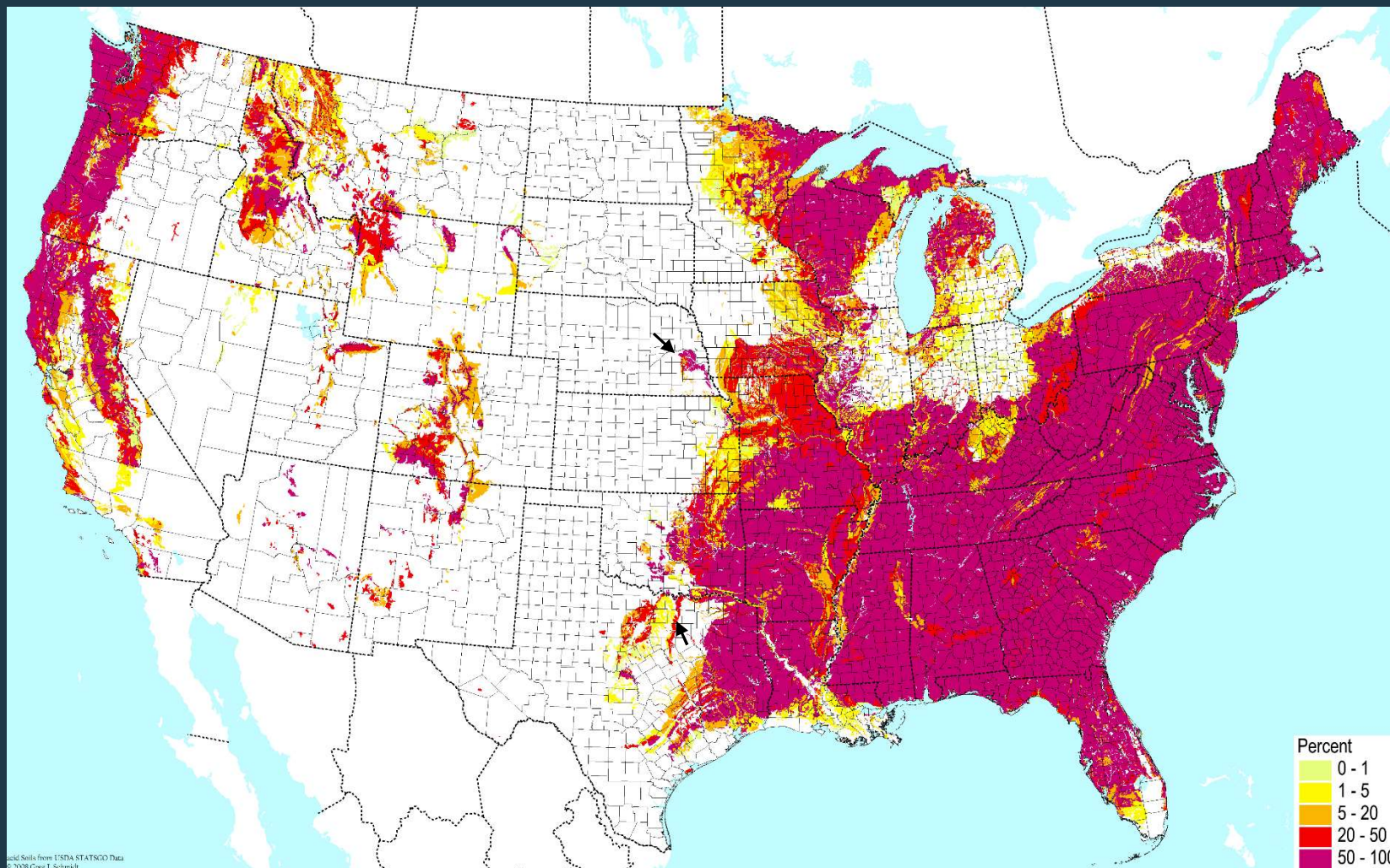
# SOIL pH



- Nutrient availability is the most important issue with pH
- Species are adapted to a range of pH
  - Provenance can inflate this range
- Typically more eastern species are adapted to lower pH soil
- This factor is extremely important in the CT, but is rarely addressed by national groups
- Arbor Day Foundation suggests azaleas based on Hardiness Zone, but fails to consider that azaleas prefer soil pH lower than 6.0

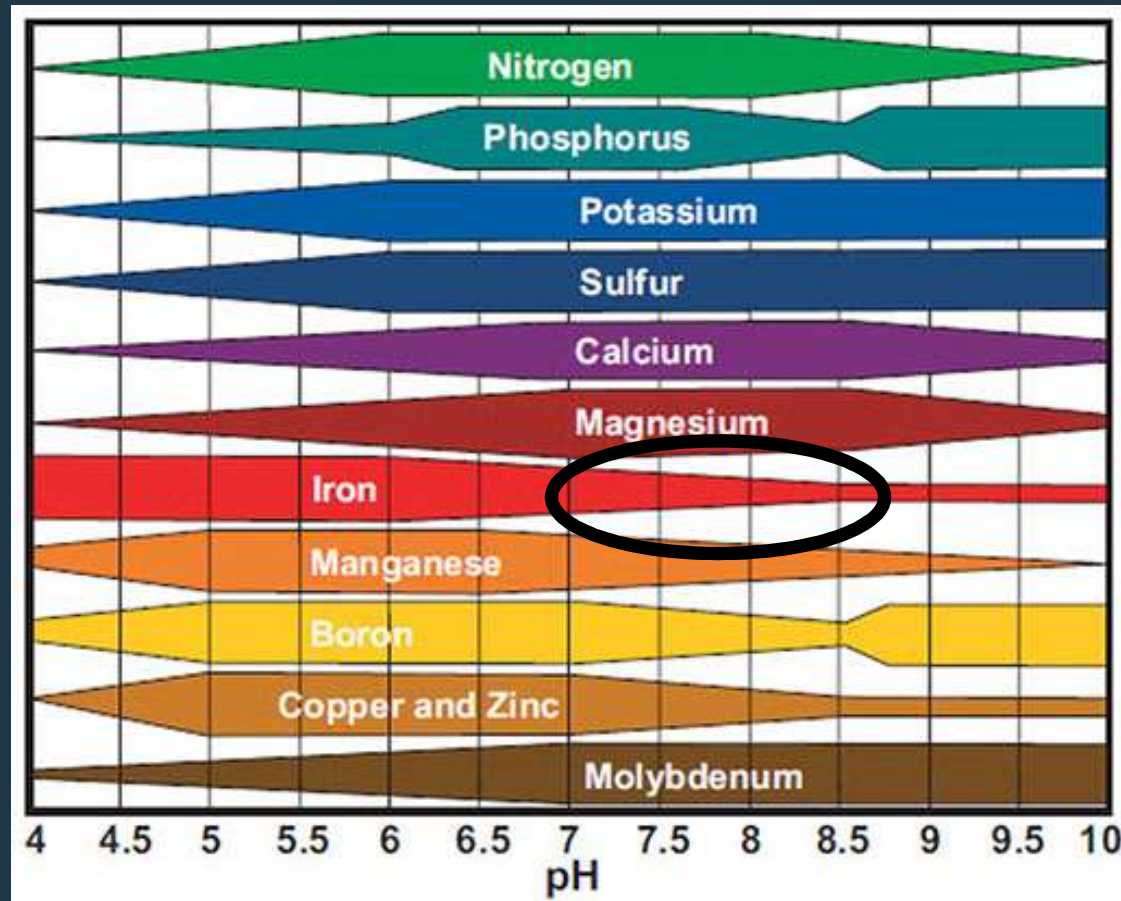


# SOIL ACIDITY



City of Arlington, Texas

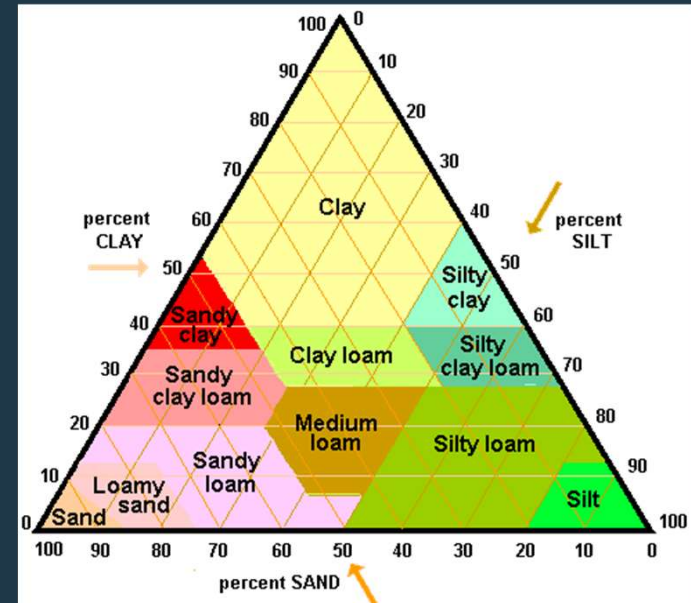
# NUTRIENT AVAILABILITY



# SOILS



- Texture
  - Sand, silt, clay
  - Generally somewhat related to pH
  - Determines water holding and sharing
  - Influences oxygen availability





# SOILS



- Drainage
  - Determined by surface layer texture and by what lies beneath
  - Clay drains poorly, limiting oxygen availability
  - Hard compacted soil, bedrock, or transition from sand to clay will create a barrier to water drainage and roots (shallow soils)
- Determining soil type
  - USDA NRCS Web Soil Survey (<https://websoilsurvey.nrcs.usda.gov>)
  - Pit drain test
  - Color and feel
    - Dark colors and mucky feel often indicate clay

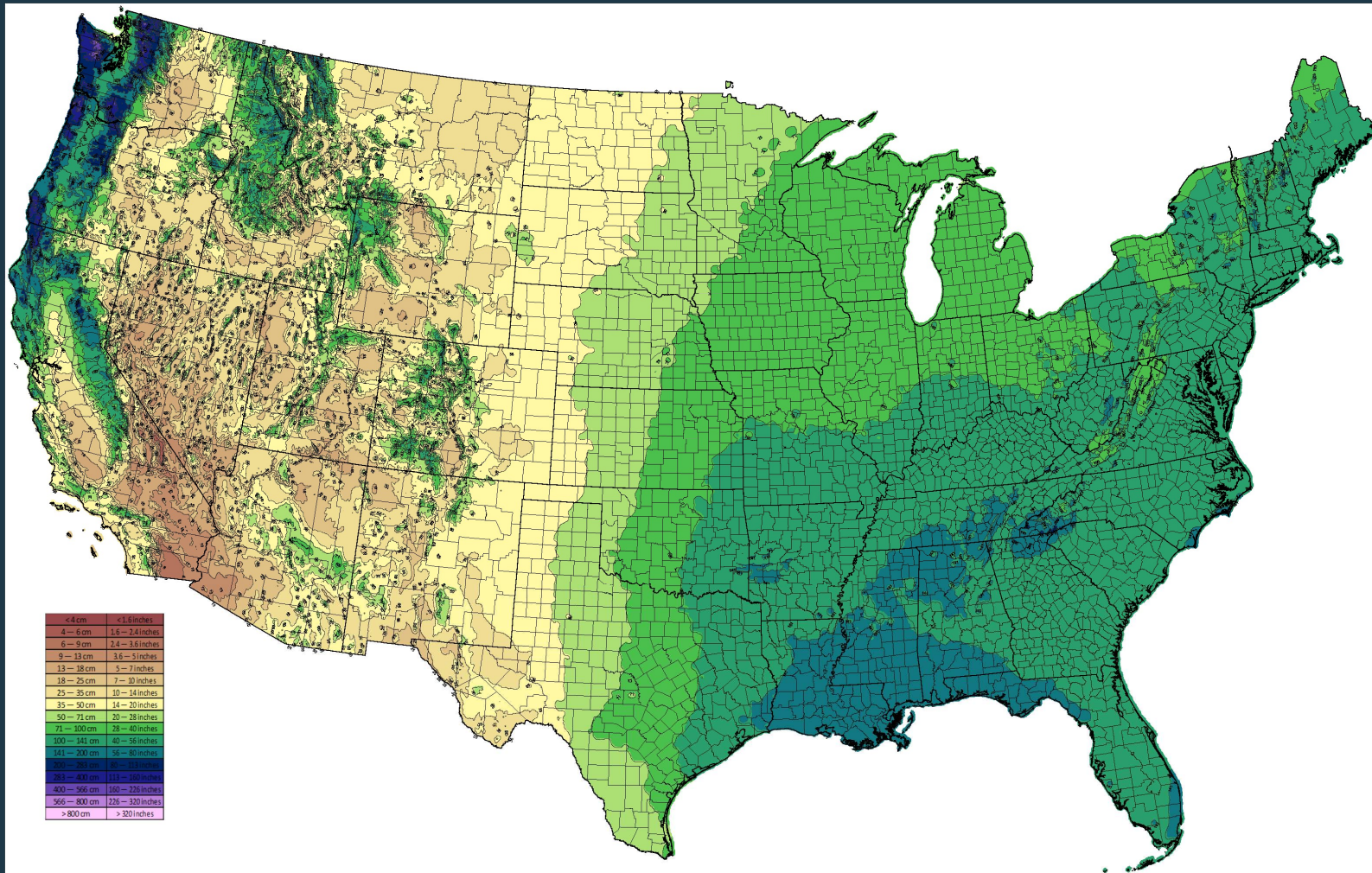
# CLIMATE

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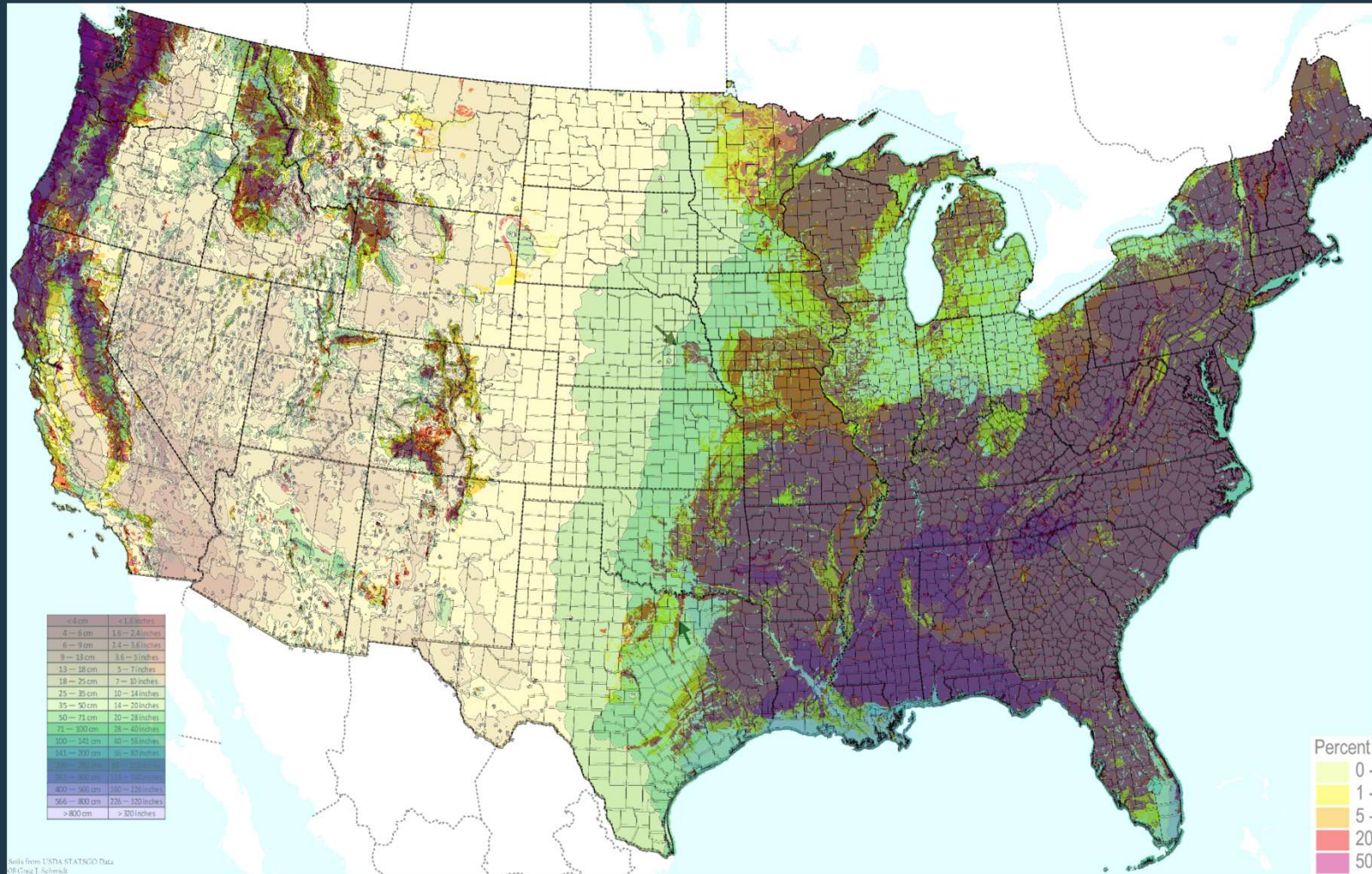
- Rainfall
  - Trees need water to survive, especially important after transplanting
  - Irrigation impacts number of species that are *possible* to plant
  - No set rainfall amounts that a species needs, but the species native range is usually indicative

# RAINFALL



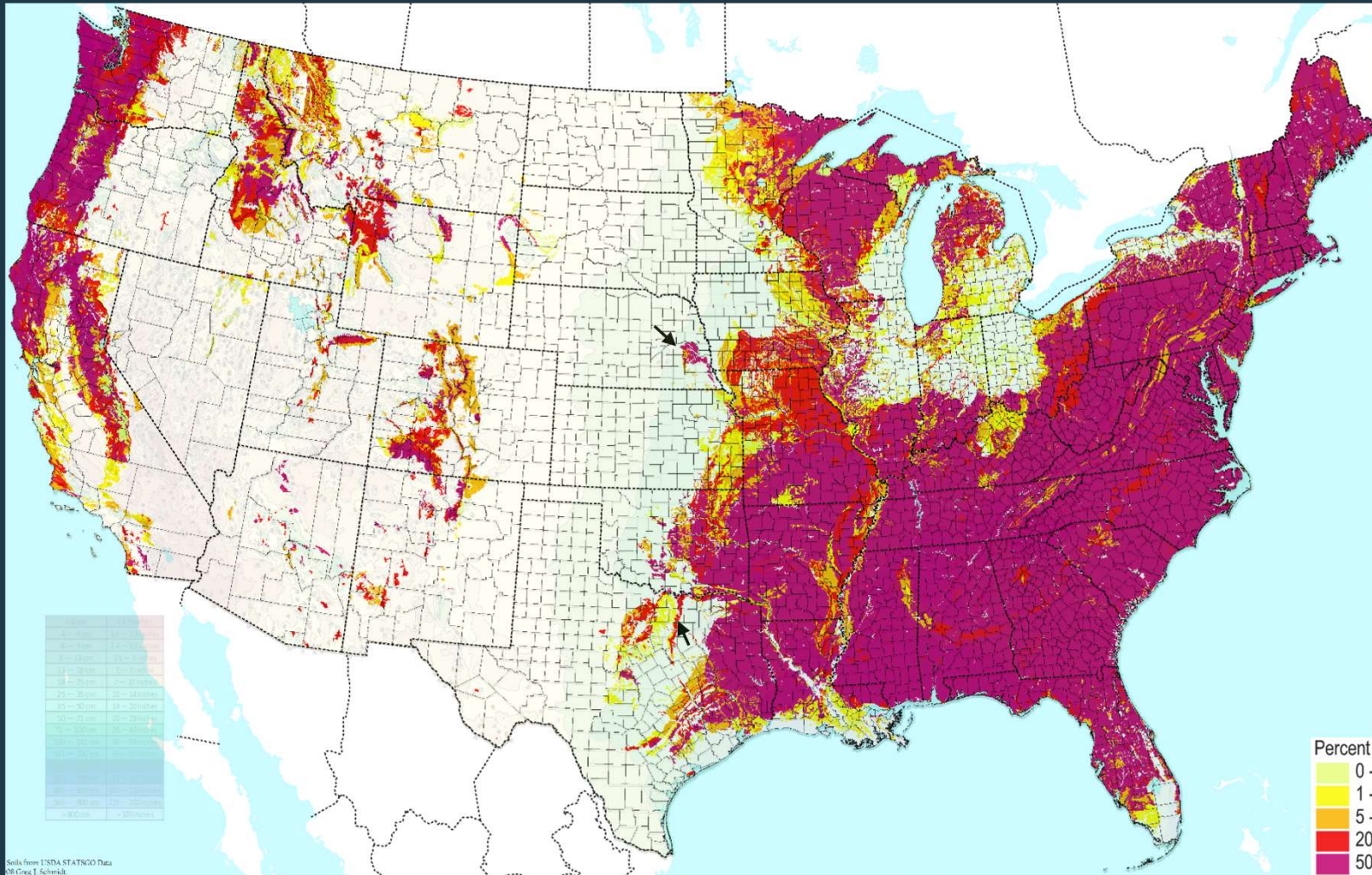


# RAINFALL





# RAINFALL AND pH





# CLIMATE

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- Temperatures
  - High temperatures
    - Spruce would not be able to survive extreme high temperatures, but it's mostly related to water
  - Low temperatures
    - Tropical species suffer dieback from winter cold and frost damage
  - Plenty of guidelines for species selection and climate
  - Nurseries typically avoid species that can't tolerate our climate

# OTHER FACTORS TO CONSIDER

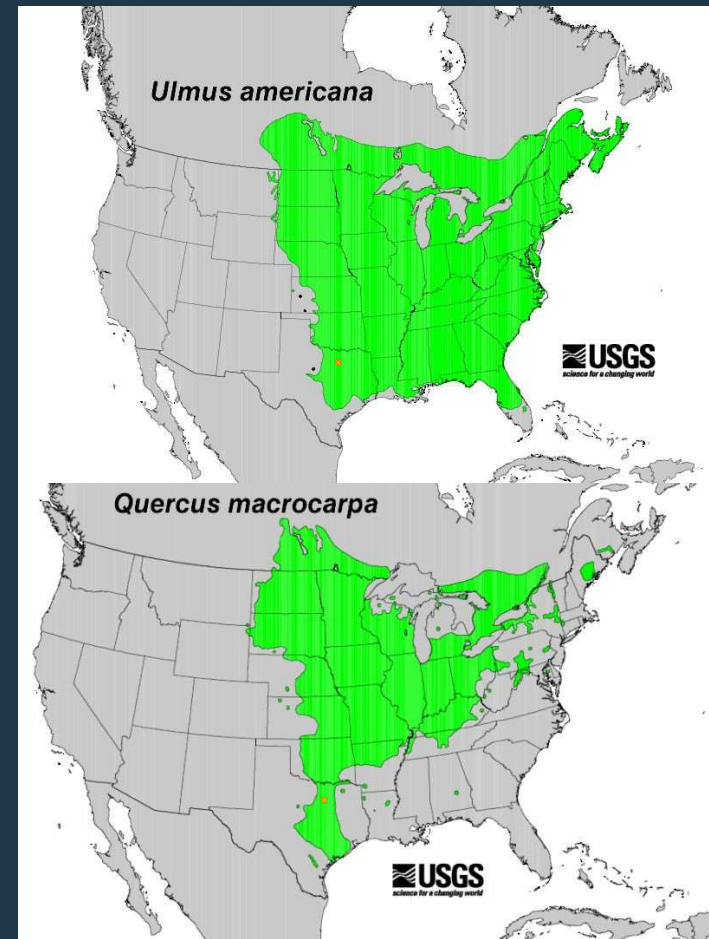


- Available space
  - Aboveground and belowground
- Sunlight exposure
  - For almost all species the concern is getting enough sunlight, but some cases of too much
  - Shade tolerance is readily available for species
- Watering habits
  - Is the lawn irrigated or in a wet location?
- Nutrients
  - Not an issue if the correct species is planted, not advisable to fertilize trees without good reason
  - Never fertilize a newly planted tree

# OTHER FACTORS (CONT.)



- Size of tree to be planted
  - Younger trees are more flexible and able to acclimate to a new site better than large trees
- Species range maps
  - Representative of natural limitations



# SURROUNDINGS

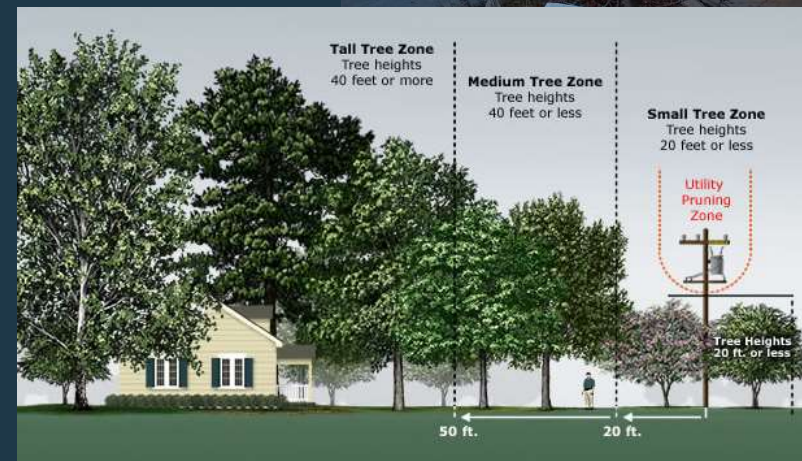
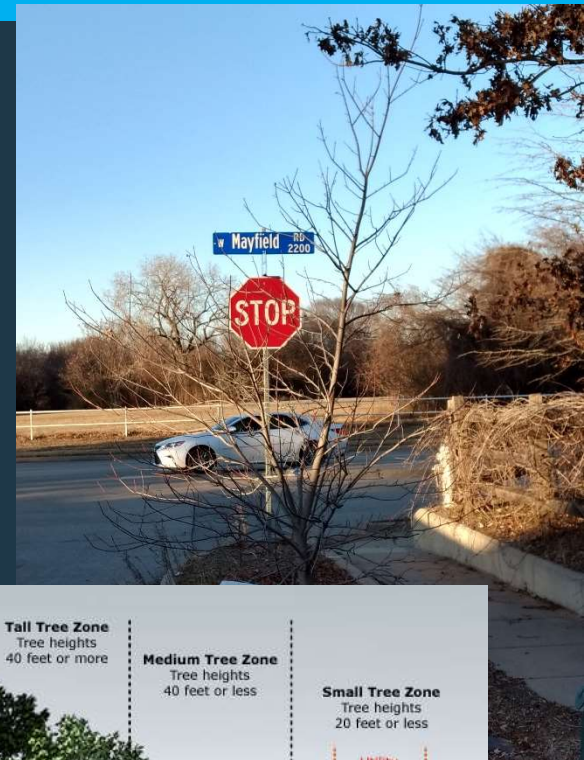
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- Very important to consider what the tree will eventually become
- Often forgotten fact by certain groups:  
Trees grow
- Not only available space, but also the eventual space
- Consider how you desire the tree to grow and how it will fill the space available

# SURROUNDINGS

- Other things to look for:
  - Power lines
  - Gas lines
  - Easements
  - Property boundaries (can you plant a tree between the sidewalk and curb?)





# SHADE TOLERANCE

- Trees require sunlight for photosynthesis to maintain a positive carbon balance
- Some species are adapted to tolerate more shade than others
- Typically related to canopy position and fast vs slow growing species

## Shade Tolerant Species

Roughleaf dogwood  
Redbud  
Mexican buckeye

## Intermediate Tolerant Species

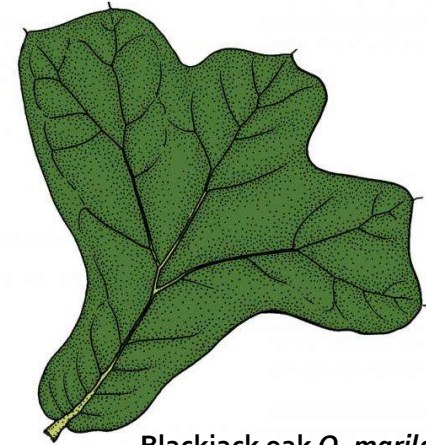
Texas persimmon  
Mexican plum  
White oak species (young)  
American elm  
Bigtooth maple  
Ash, Green and Texas

## Shade Intolerant Species

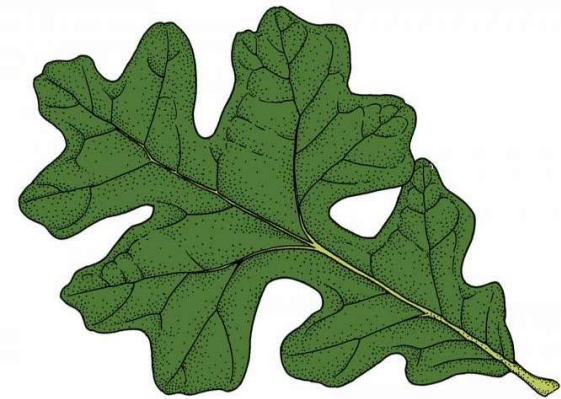
Bald cypress  
Red oak species  
Southern yellow pine

# OAK SPECIES NOTE

- There are at least 34 recognized species of oak in Texas alone
- Oaks are often classified as white or red oaks
- Red oaks have a bristle-tip
  - Shumard, blackjack, water, willow



Blackjack oak *Q. marilandica*



Post oak *Q. stellata*

# SUMMARY

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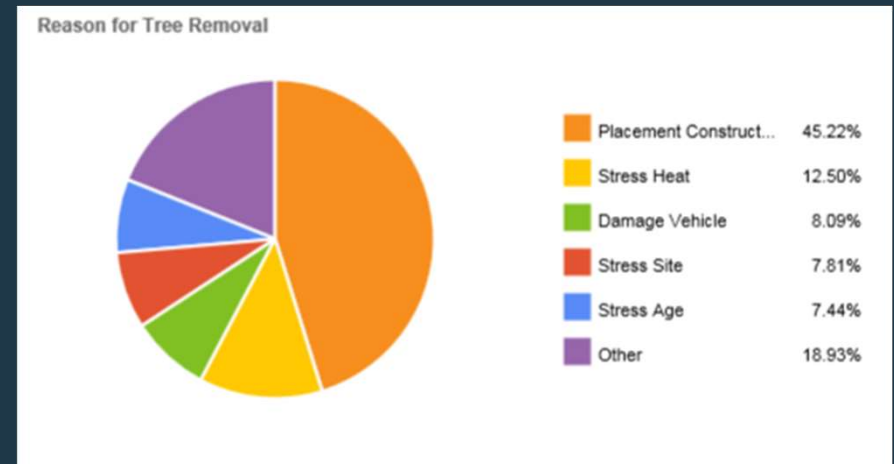


- Climate and rainfall are important, but are consistent for North Texas
- Soils vary dramatically with huge implications
- Native species are easiest to predict, but some well suited non-natives could be acceptable
- Biology and adaptation to natural environment are important to consider

# COMMON MISTAKES



- Picking the wrong tree for the wrong spot
- Species not getting water requirement
- Planting without considering the future
- Selecting trees based on name (e.g. *redbud*, Texas *red* oak, Callery *pear*) instead of facts



# SPECIES OPTIONS



Good species that are not overly planted	Type	Best Site
Bald cypress (beware of root knees)	Shade	Wet, clay
Pine (Slash or Afghan)	Shade	Slash-sand, acidic soils. Afghan-anywhere
Sweetgum	Shade	Loam, prefers low pH (<7.2)
Pecan	Shade	Wet, but not swampy
Texas ash (limited for fear of EAB)	Shade	Anywhere, tolerates dry sites
Monterrey oak/Mexican white/netleaf	Shade	Clay, alkaline soils
Honey locust (beware of thorns)	Shade	Anywhere except highly alkaline soils (>8.0)
Eastern redcedar	Shade	Anywhere, does very well in clay
Magnolia	Shade	Sandy loam, acidic soils
Cupressus arizonica	Shade	Loam
Ginkgo	Ornamental	Loam, dry, non-clay soils
Desert willow	Ornamental	Dry, non-irrigated lawns or good drainage
Vitex	Ornamental	Anywhere, tolerates clay
Mexican plum	Ornamental	Prefers somewhat dry
Eve's necklace	Ornamental	Anywhere, wet to dry
Gum bumelia	Ornamental	Loam, low pH
Mexican buckeye	Ornamental	Clay, alkaline
Dogwood	Ornamental	Loam, prefers acidic but tolerates alkaline, shade
Mexican serviceberry	Ornamental	Dry, probably loam
Deciduous holly	Ornamental	Wet, possibly clay