Impact of Agricultural Practices

Duration
5–7 class sessions of approximately 40 minutes each

Resources

1. Image of Providence Canyon, Lumpkin, GA

2. Images from Dust Bowl

3. Images of dead zones of waterways (Gulf of Mexico)

FRQ practice
AP® Exam 2017 Q3 a, b, c

How to Use This Lesson Plan
This lesson is intended to build student interest in agricultural practices and the effects of poor land management practices—especially removal of native plants, clear cutting, and over fertilization (all Human Impact). This is a good introductory lesson to agriculture or segue lesson from water quality into soil management.

As you begin this lesson, consider providing the names of the images to be used and allow students to research the areas to begin with to prepare for upcoming class discussions.

During class discussions, show the students the images provided below. Discussions should center around cause and effect.

- *What agricultural practice lead to this type of damage?*
- *Were there other factors which led to the formation of this canyon?*
- *What are the long-term effects if we were to continue these practices?*
- *Now thinking about what you have viewed of the Providence Canyon, let us now compare to the Dust Bowl.*
- *(Dust Bowl) Why do you think prairie plants have such deep root systems? What are the advantages of this?*
- *What might have been an alternative agricultural practice that could have been used to prevent the Dust Bowl? (looking to discuss things such as wind breaks, intercropping etc.)*
- *How or why did these farmers participate in such bad agricultural practices? Where did they come from (here is where you reference the migration from the East Coast – tying back into the devastation in Providence Canyon caused by clear cutting)*

NOTES
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- *(Gulf of Mexico) What is long term effect on our fishing industry? Tourism industry?*
- *What agricultural practices could be instituted to reduce the effect of eutrophication in the Gulf of Mexico?*

Extensions

1. Have students design an experiment to monitor the health of the Gulf of Mexico if agricultural practices were changed to more sustainable practices. You want students to mention specific tests pH, Nitrogen, Phosphorous, DO, micro invertebrates, turbidity—all water quality tests. The task could also be used to monitor the health of a specific species of fish found in the Gulf of Mexico. Students should identify IV, DV, Hypothesis, tests, and data collection.
2. Virtual Lab Experiences: **https://coast.noaa.gov/estuaries/** (search for various activities under teacher resources)

Technology Integration

- Google Earth
- Padlet
- Break out rooms—an expert teaching technique. Assign groups a specific topic to become expert in an assigned topic. Students work together to research the topic, then report back to whole group and present. This is a good way to segue this lesson into different agricultural practices (5.5), sustainable agriculture (5.15), or sustainable forestry (5.17).

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Image Resources

Providence Canyon, Lumpkin, GA

Dust Bowl Image—1930's

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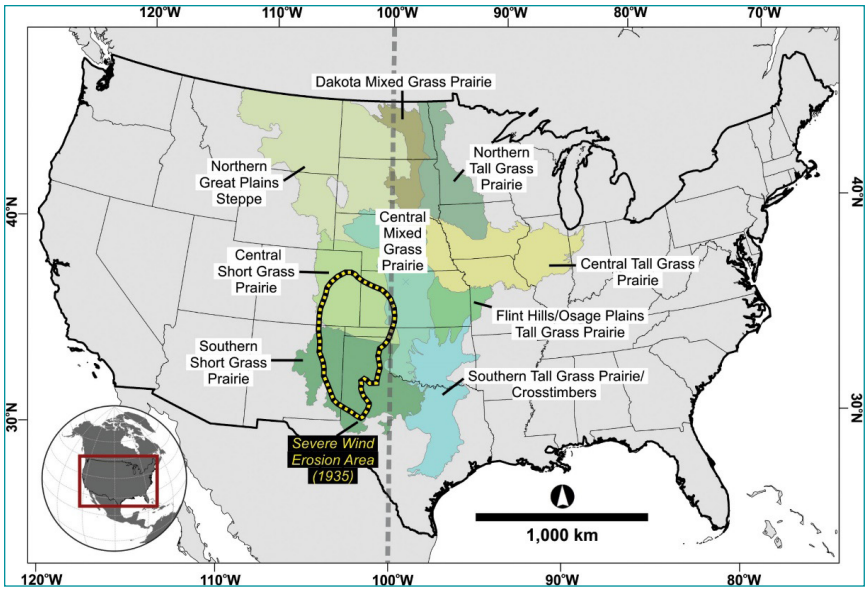
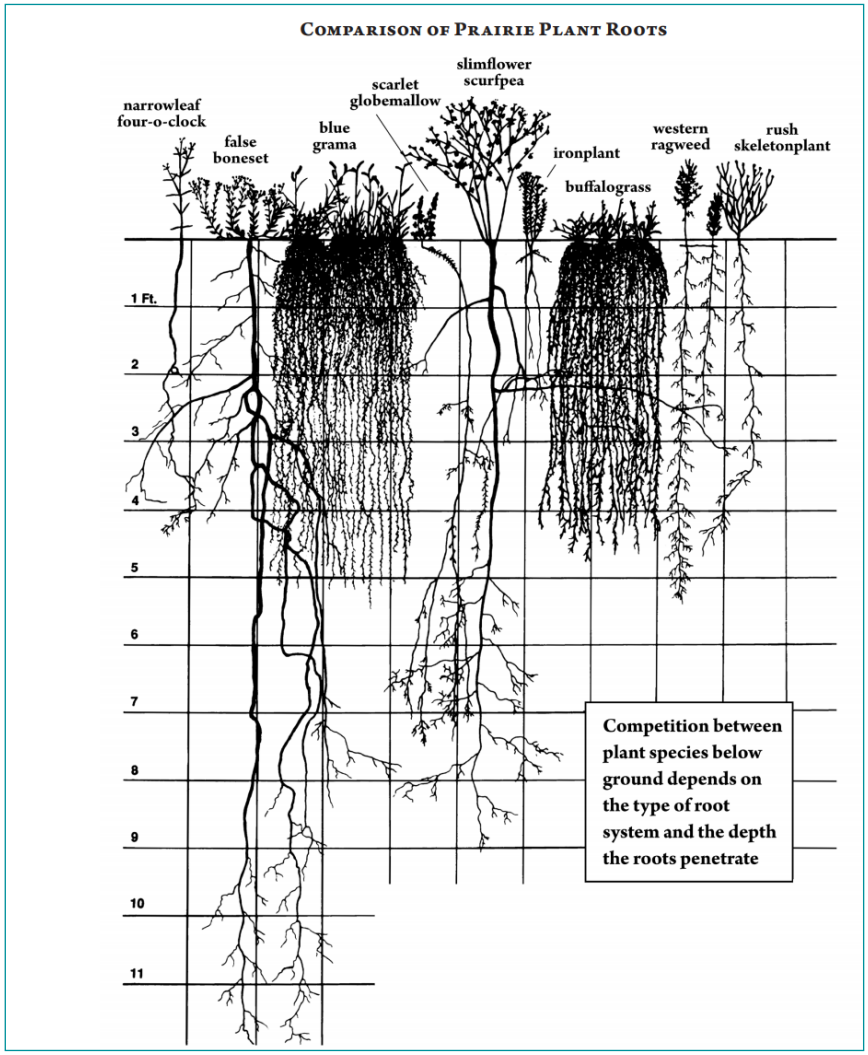


Native Grasses Grown by Area Prior to Dust Bowl of 1930



Comparison of Root System of Common Prairie Grasses

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Dead Zone of Gulf of Mexico

Note: It is suggested you reference a map of the United States and follow the Mississippi River from Minnesota to the Gulf of Mexico and point out the agricultural land the river passes through.

NOTES

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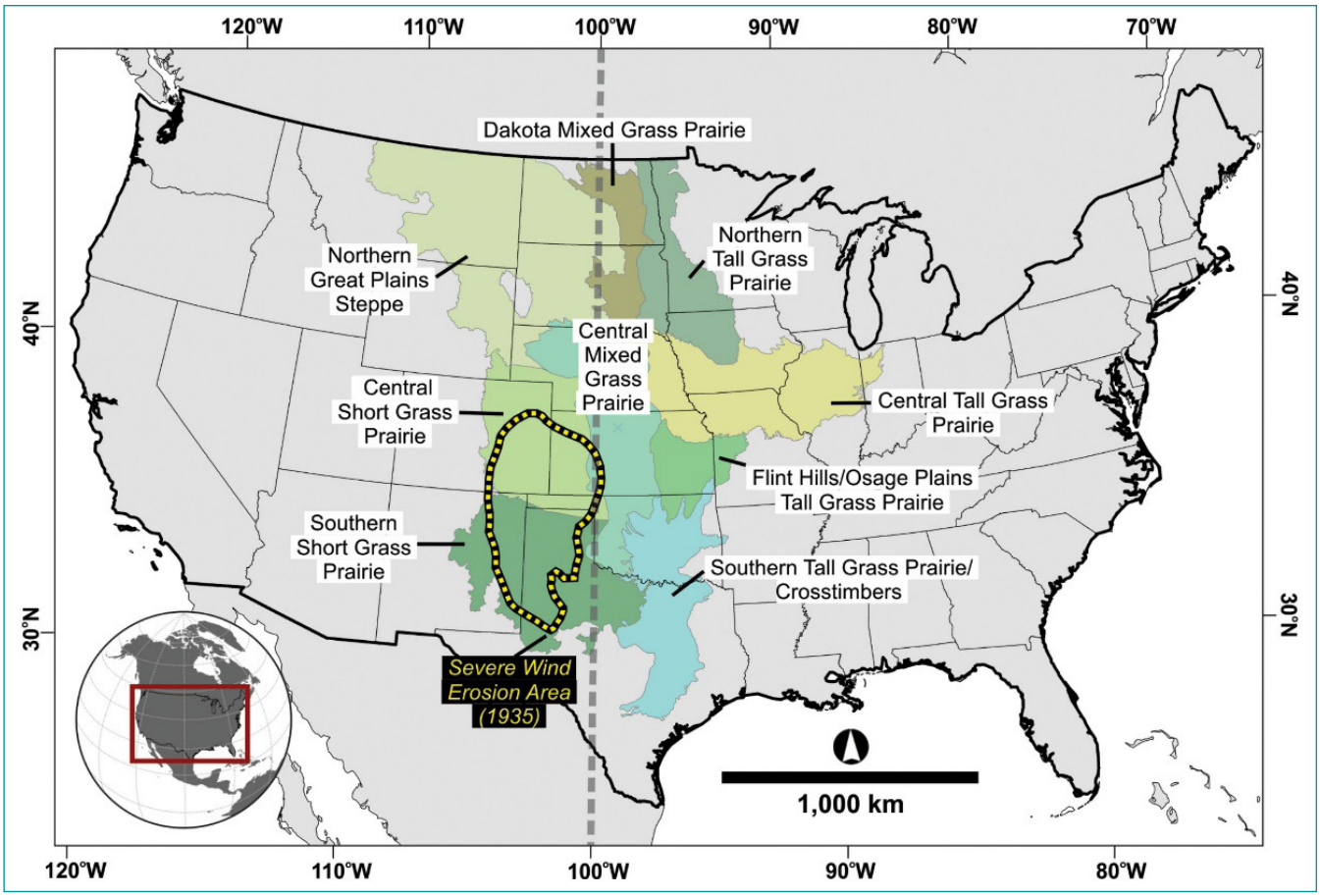
Image of Providence Canyon, Lumpkin GA

Providence Canyon, Lumpkin, GA

Images from the Dust Bowl

Dust Bowl Image—1930's



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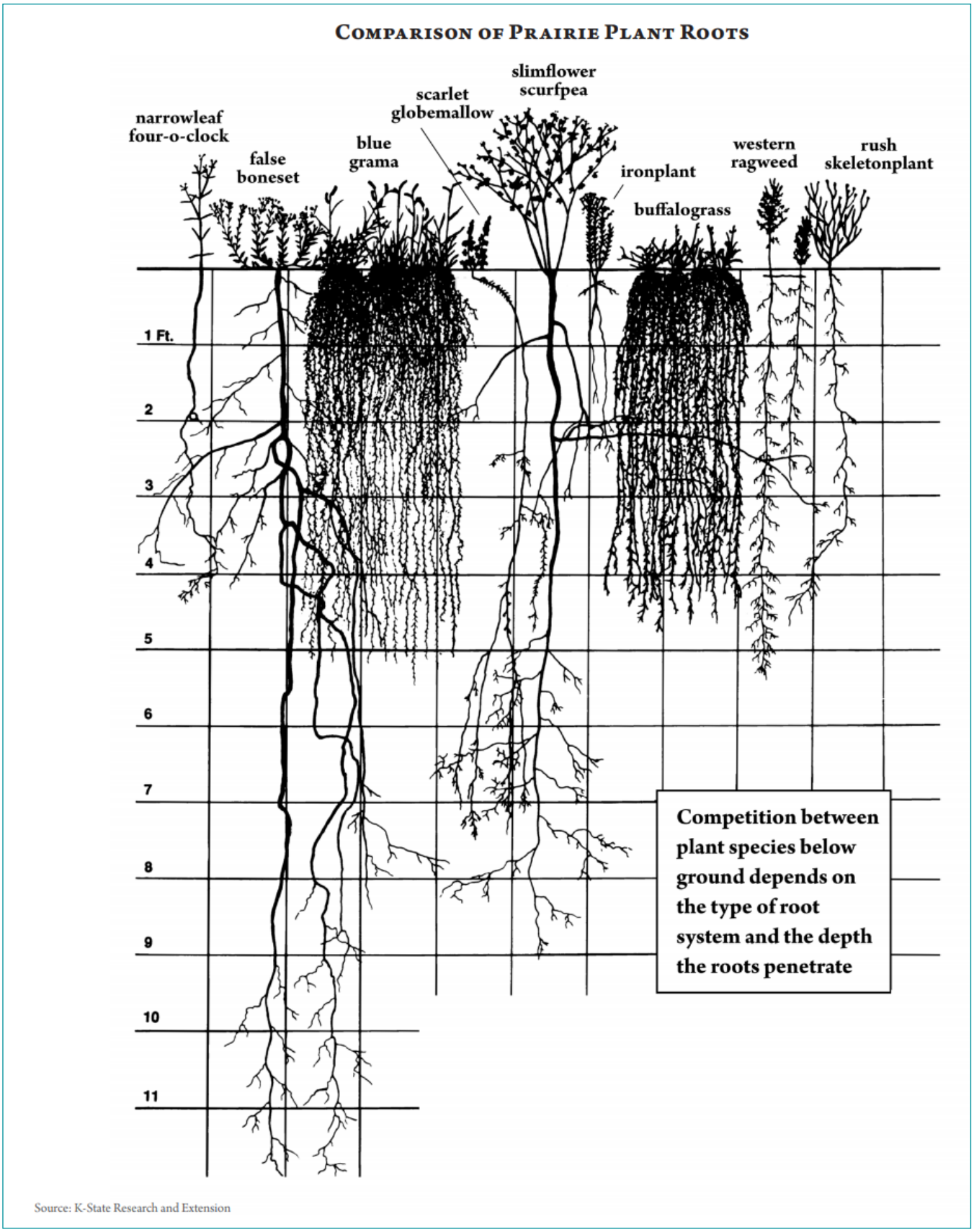

Comparison of Root System of Common Prairie Grasses

Images from Dead Zones of Waterways

Dead Zone of Gulf of Mexico