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# Tree Rings

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Trees submerged in flood water for an extended period of time will likely have a poor growing season.

Cass County Soil Conservation

The most commonly known use of tree rings is to find a tree's age. A tree forms one ring each year, so counting the rings easily determines the age of the tree. However, tree rings give much more information than age alone. Looking at the spaces between tree rings can tell whether a year had good or bad growing conditions. If there is a large space between rings, it means that particular year had good growing conditions and the tree grew a large amount. If tree rings are close together, it means that particular year had conditions that only allowed the tree to grow a small amount.

Weather conditions such as floods and droughts can stunt a tree's growth and cause a bad growing season. However, if a year has a lot of sunshine and an average amount of rain, a tree is able to grow much more. The tree

cross-sections to the right display how tree growth varies from year to year. Tree rings on existing and dead trees buried in the banks of the Red are one of the tools used by researchers to determine what flood elevations were before recorded history.

## Floods

Trees grow in areas best suited for their water, mineral, and temperature range requirements. Trees in the riparian forest grow at different elevations along the bank because of their sensitivity to being flooded. Depending upon the species and the duration of the flood, many trees along the Red can survive and even continue growing through a flood. Even flood-sensitive trees can usually avoid injury if the flood waters recede in one week or less. However, if flood waters cover the roots of sensitive trees for prolonged periods, the tree can sustain major damage. Symptoms of a flood-damaged tree include leaf chlorosis, or the yellowing of a tree's leaves, downward curling of leaves, and loss of leaves. Without leaves, trees cannot carry out photosynthesis and eventually die. More damage is done when the entire tree is submerged, which is often seen in young or small trees.

Trees can sustain damage even after flood waters recede since soils remain wet for a long time after the flood retreats. Waterlogged soils prevent oxygen from penetrating to tree roots, which can drown trees just as effectively as a flood. However, except in cases where flood waters persist for months, many trees experiencing flood conditions can survive.

## Droughts

A tree damaged by a drought looks very much the same as a tree damaged in a flood. Leaves wilt and even fall off, and both coniferous and deciduous trees show yellowing in their needles and leaves. However, these effects are caused by the opposite reasons of flood-damaged trees. In a drought, there is not enough water for trees to absorb through their root systems. As a result, minimal water makes its way up through the trunk and into the leaves. When leaves don't get water, photosynthesis is hindered and the tree cannot gather its necessary nutrients. While a prolonged drought can kill a tree, trees have water reserves and can therefore survive a mild drought. Although the Red River is known for flooding, it has gone completely dry several times in the past.

