



Forest and Tree Health 2012

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UA Division of Agriculture

Cooperative Extension Service

Introduction

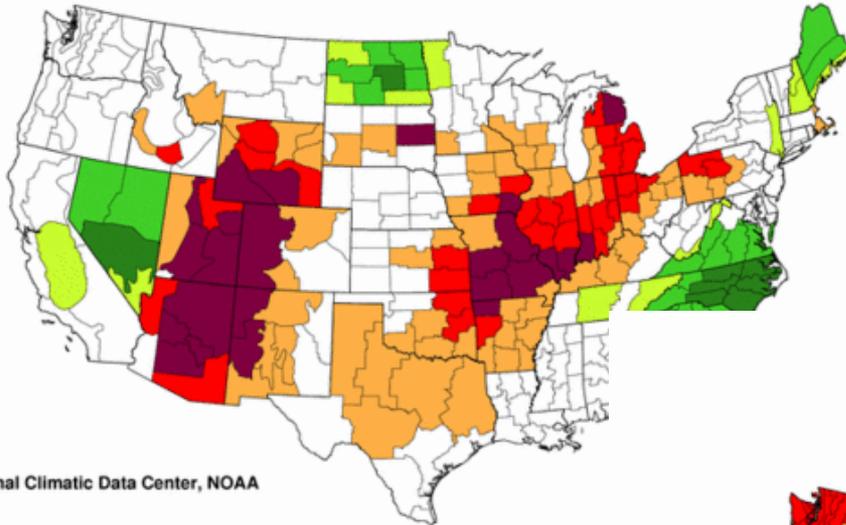
- ☀ Common Problems This Year
- ☀ A Few Common Insects & Diseases
- ☀ Exotics
- ☀ Web Resources



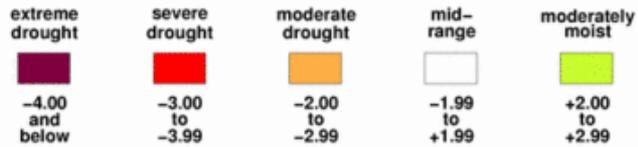
Historical Drought Conditions

- ✦ Drought periods in 1920's, 1940s, 1960s, 1980
- ✦ The Ozarks experienced a severe drought period from 1998 to 2000
- ✦ Mild drought period in 2005 and 2006.
- ✦ Droughts common each decade
- ✦ http://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers.php?index=pdsi&month%5B%5D=1&beg_year=1900&end_year=2011&submitted=Submit
- ✦ And now the past 2 years

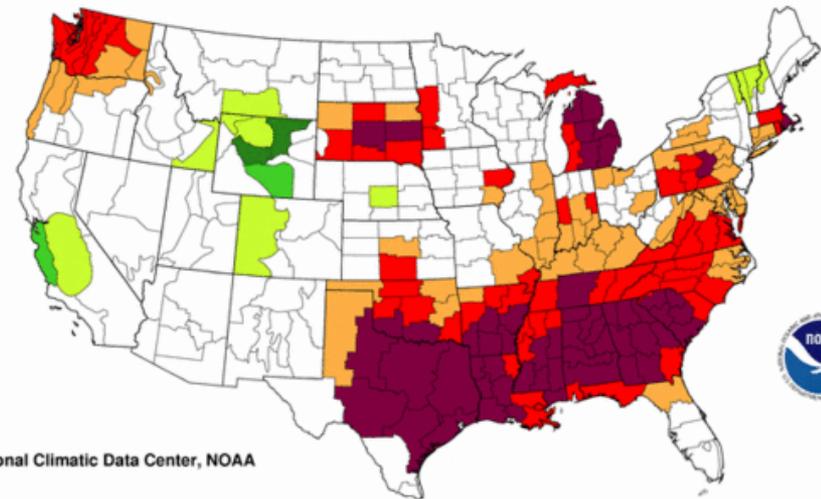
Palmer Drought Severity Index September, 1901



National Climatic Data Center, NOAA



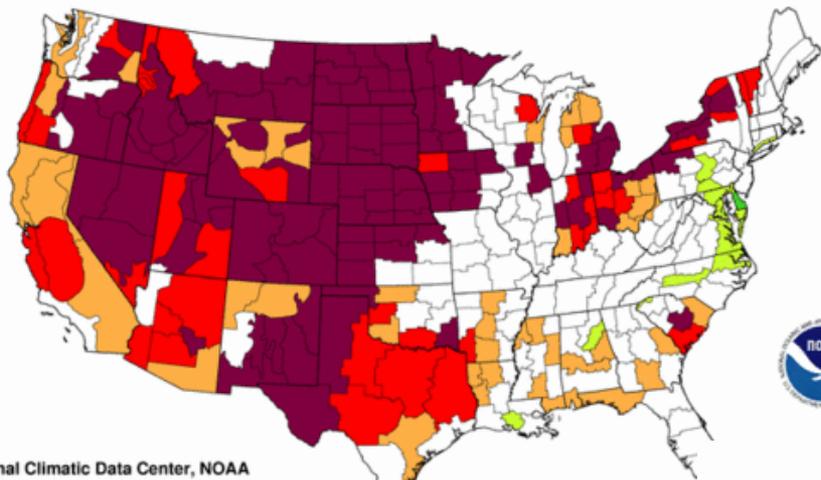
Palmer Drought Severity Index August, 1925



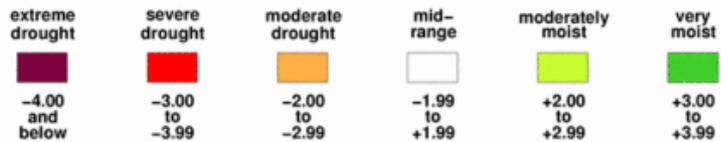
National Climatic Data Center, NOAA



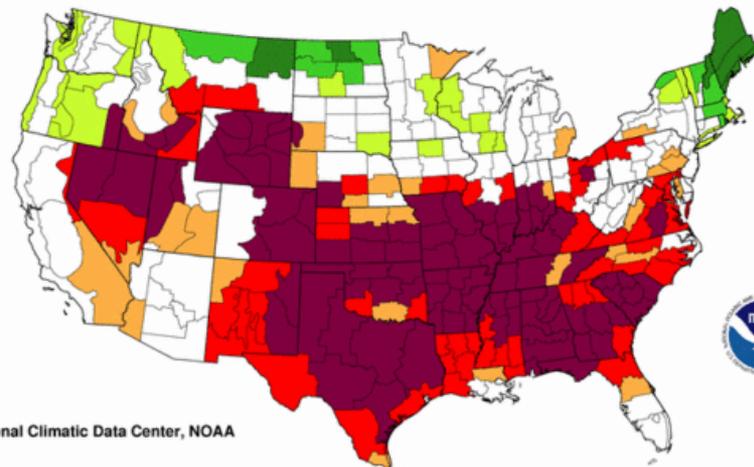
Palmer Drought Severity Index September, 1934



National Climatic Data Center, NOAA



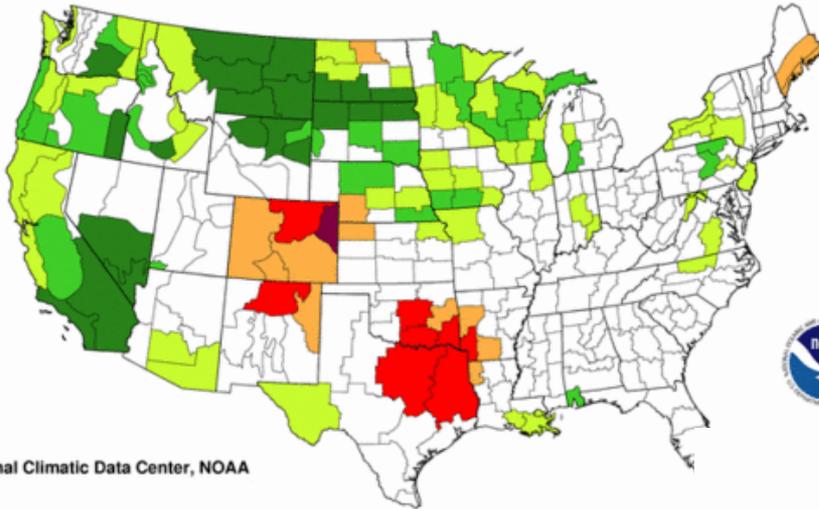
Palmer Drought Severity Index September, 1954



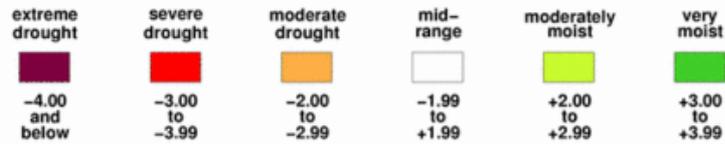
National Climatic Data Center, NOAA



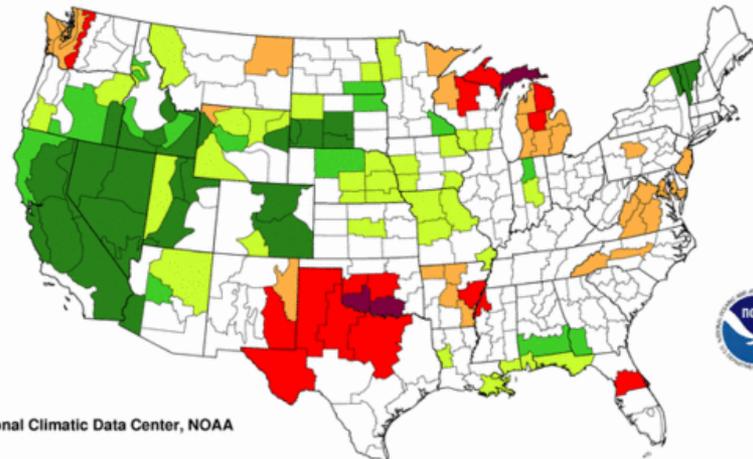
Palmer Drought Severity Index September, 1978



National Climatic Data Center, NOAA



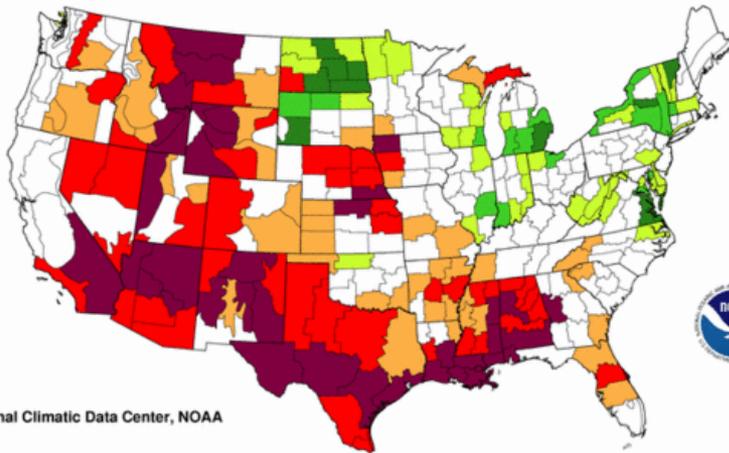
Palmer Drought Severity Index September, 1998



National Climatic Data Center, NOAA



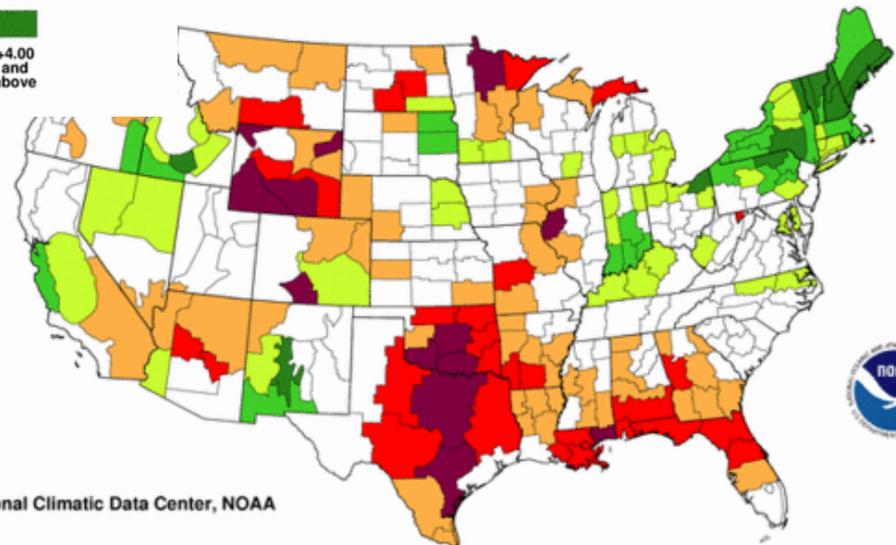
Palmer Drought Severity Index September, 2000



National Climatic Data Center, NOAA



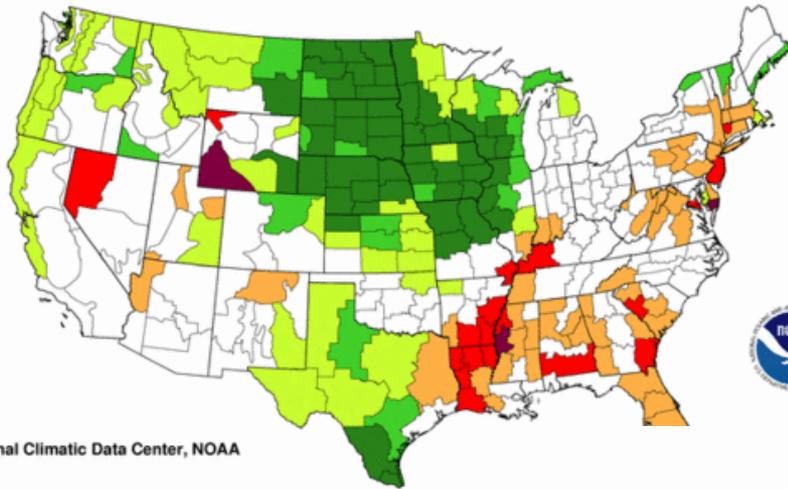
Palmer Drought Severity Index September, 2006



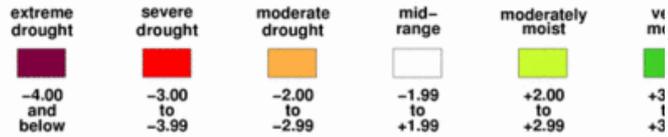
National Climatic Data Center, NOAA



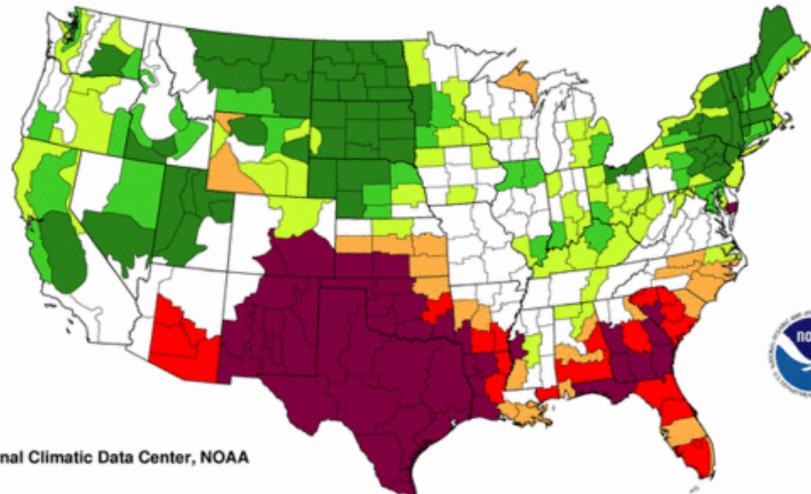
Palmer Drought Severity Index September, 2010



National Climatic Data Center, NOAA



Palmer Drought Severity Index September, 2011



National Climatic Data Center, NOAA

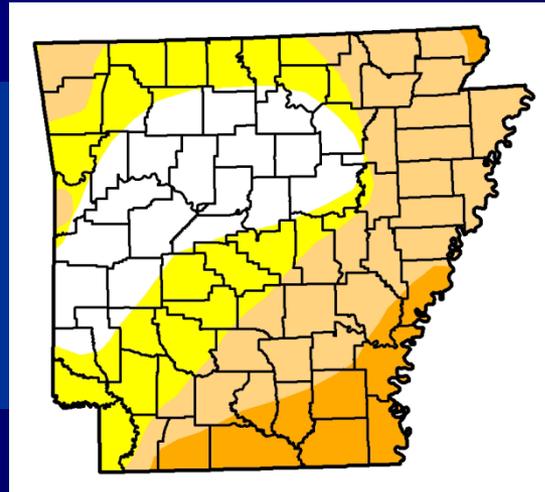




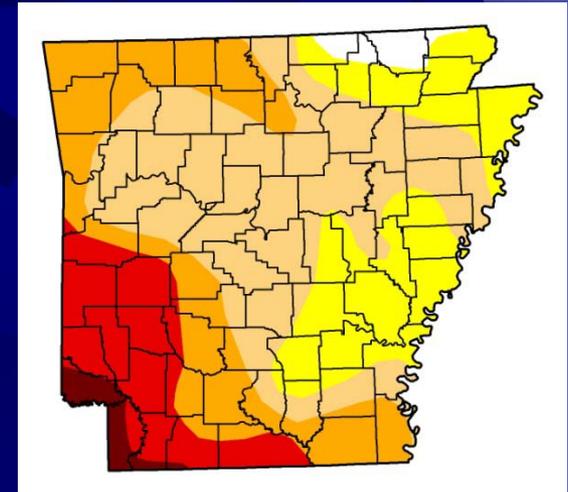
Drought Conditions

Week	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
September 14, 2010	25.83	74.17	47.26	12.50	0.00	0.00
September 13, 2011	2.18	97.82	76.51	38.09	15.82	2.10

Intensity:
D0 Abnormally Dry
D1 Drought - Moderate
D2 Drought - Severe
D3 Drought - Extreme
D4 Drought - Exceptional

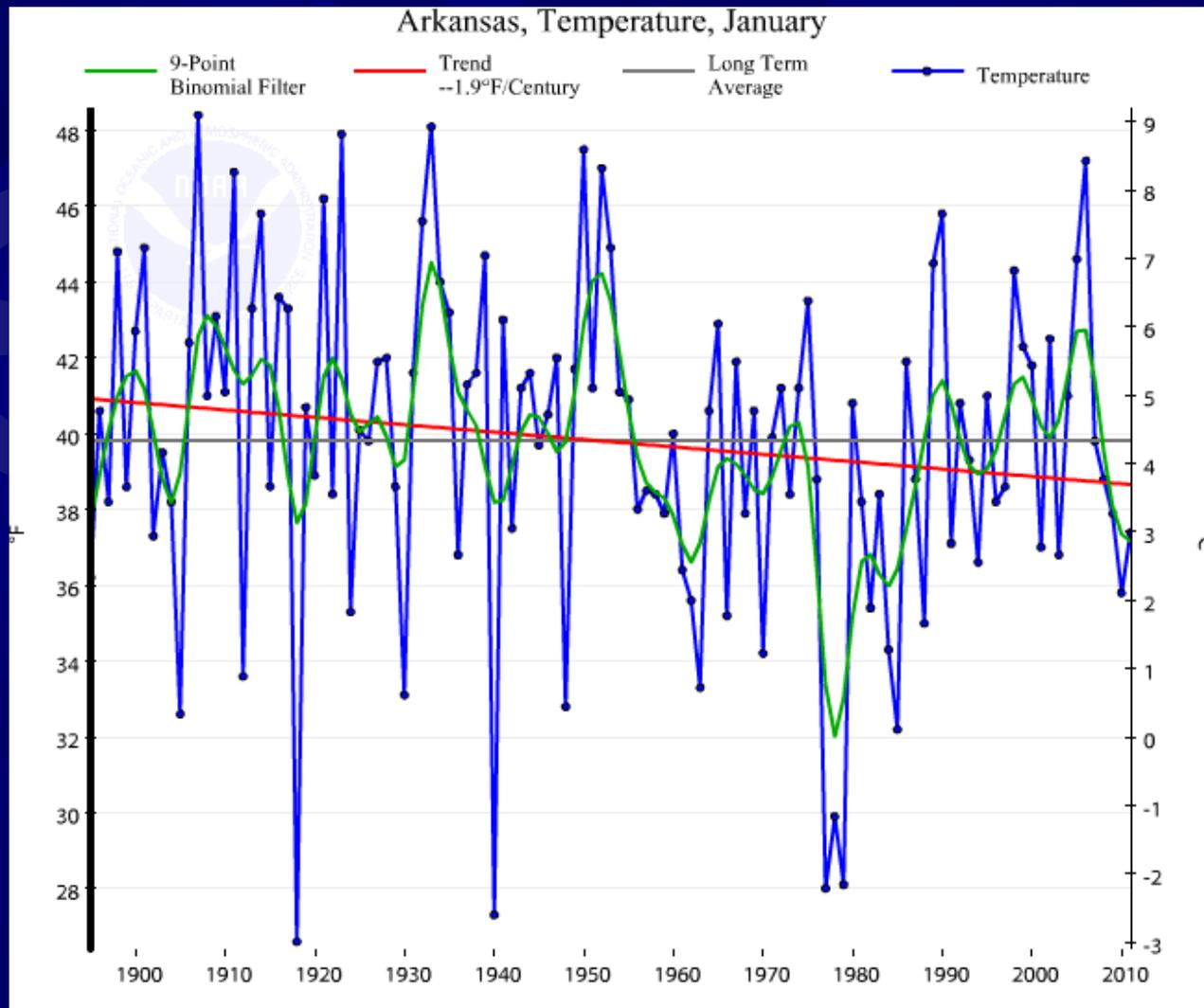


2010

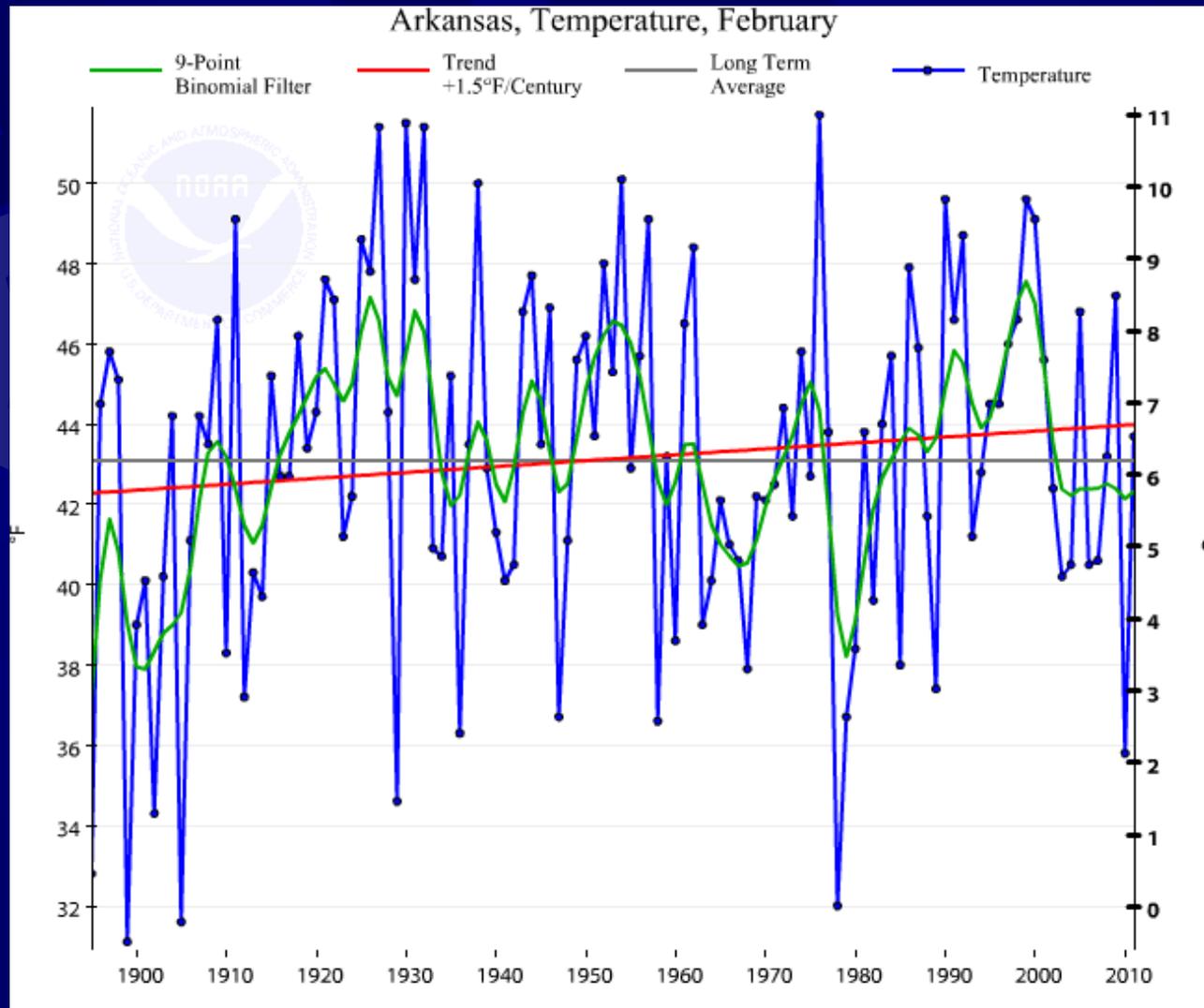


2011

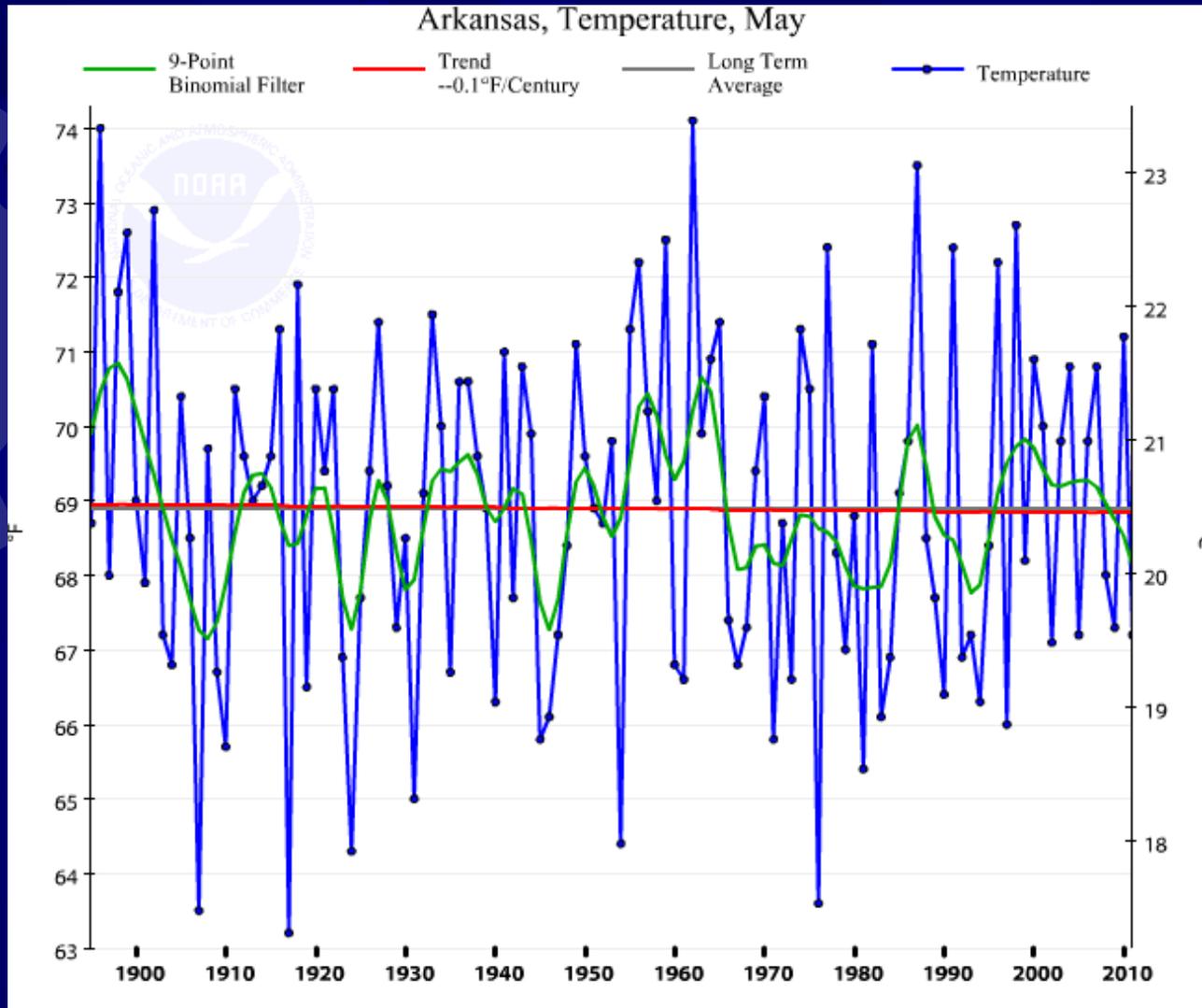
What About Global Warming?



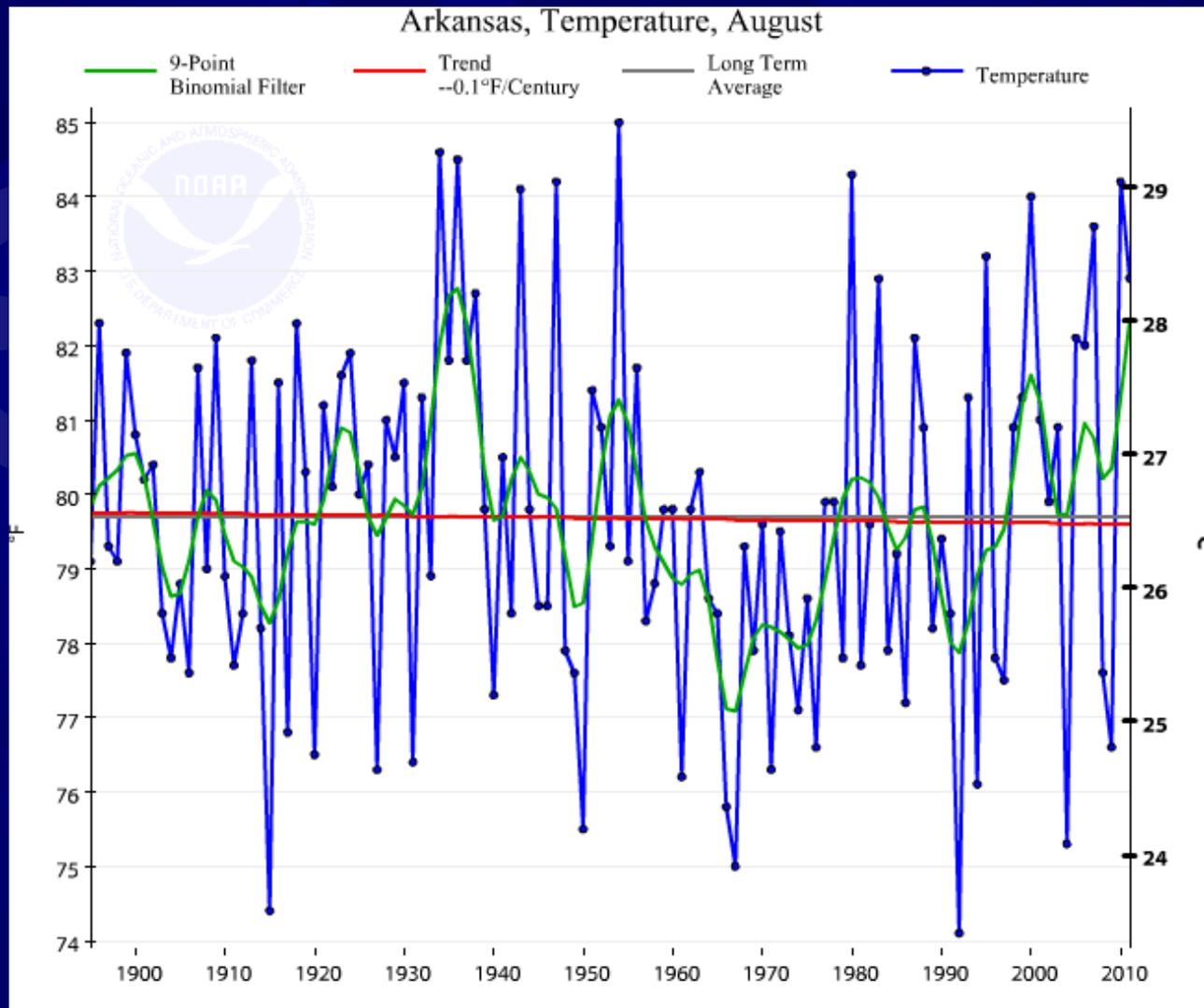
Global warming.....



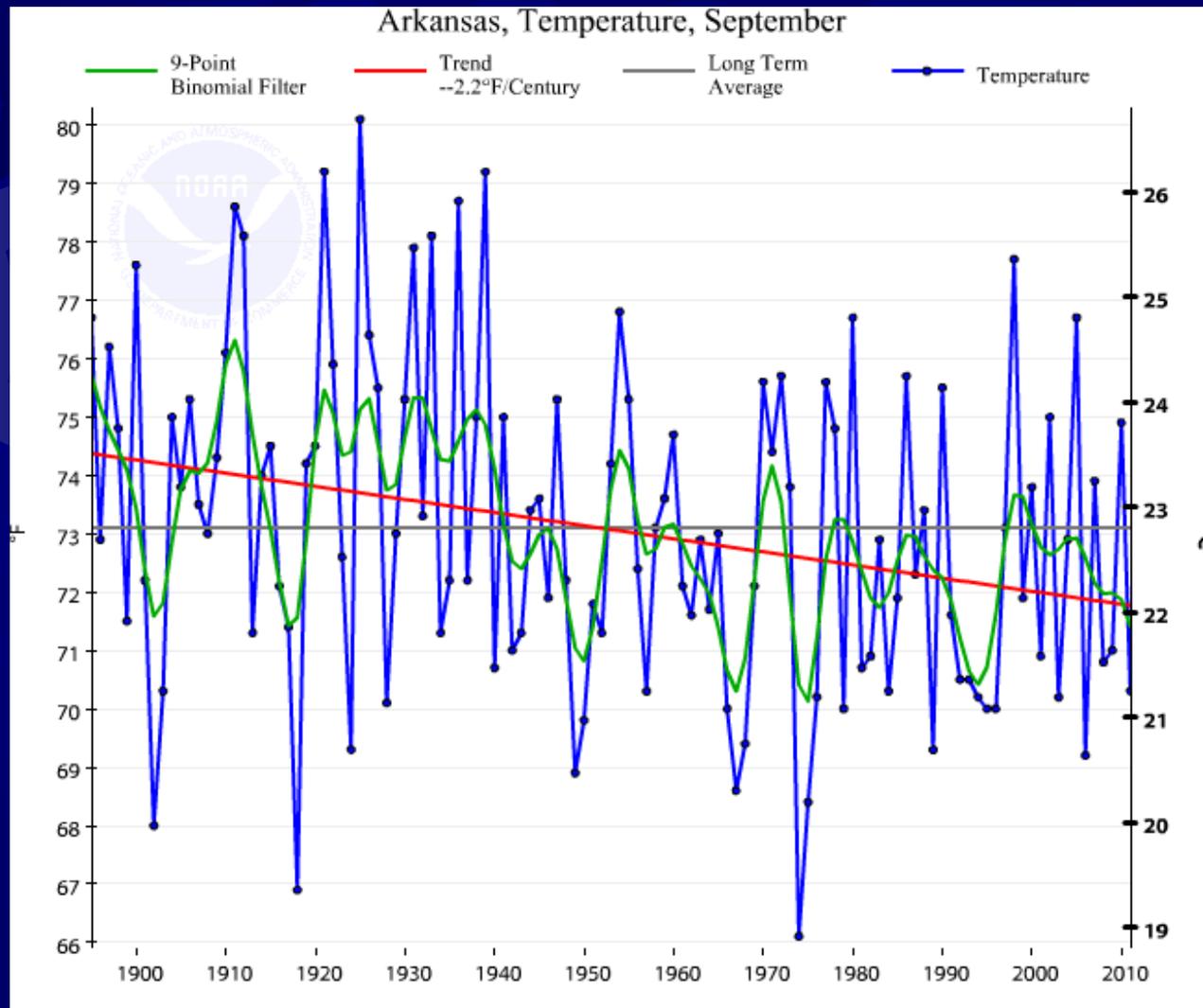
Global Warming...



Global Warming.....



Global Warming.....



So What?

- ✱ Drought is periodic
- ✱ Data suggests certain trends
- ✱ Some of our forests & trees survived all of these natural cycles
- ✱ No real trend in warming.. That's what the data suggests.
- ✱ Bottom-line: drought & environmental extremes are “normal” over the long run.

Drought Effects on Trees

- ☀ Trees naturally lose leaves to conserve water & energy
- ☀ Lack of water limits growth & curtails photosynthesis
- ☀ Stress weakens tree
- ☀ More susceptible to disease and insect attack
- ☀ Moisture stress will kill even the largest tree



Symptoms of drought injury

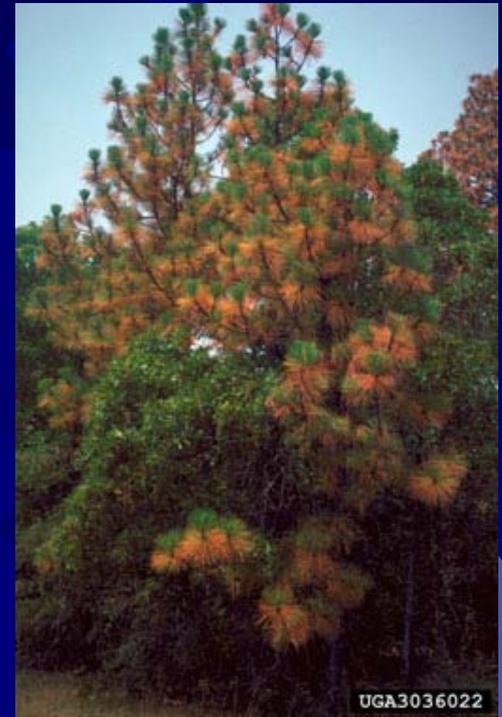
- Can be sudden or may take up to two years to be revealed.
- Symptoms on tree leaves include wilting, curling at the edges, and yellowing.
- Deciduous leaves may develop scorch, brown outside edges or browning between veins.
- Evergreen needles may turn yellow, red or purple.
- In continued drought, leaves may be smaller than normal, drop prematurely



Effects of Drought

☀ Cumulative impact might last up to 10 years

☀ REMEMBER: it's part of nature.
Native trees “designed” to withstand certain amount of stress



Hypoxylon Canker

- ✦ Affect most oak species
- ✦ Id by sloughing bark
- ✦ Grayish slick places
- ✦ Brown fungal spores
- ✦ Quickly kills the tree
- ✦ Usually secondary to some other stress
- ✦ No control except removal



Red Oak Borer & Oak Decline

- ★ Estimated 50% oaks in NF dead/dying in 2000
- ★ Severe damage to lumber
- ★ Massive population buildup
- ★ W/ 600 per tree, can easily spread
- ★ Triggered by overstocking on poor soils
- ★ 2 Successive drought years
- ★ Populations have declined
- ★ Will see what happens this year



Pine Bark Beetles

Three Main Types

- ☀ Ips (3 different types)
- ☀ Southern Pine Beetle
- ☀ Turpentine Beetles

Attack Loblolly & Shortleaf

All 5 occur throughout the SE



Descriptions of *Ips* Beetles

☀ Sixspined *Ips*

- Largest *Ips* beetle: attacks lower
- 6 spines each side on posterior

☀ Small Southern Pine Engraver

- Smallest: attacks top
- Second most destructive (SPB is #1)
- 4 spines on each side on posterior

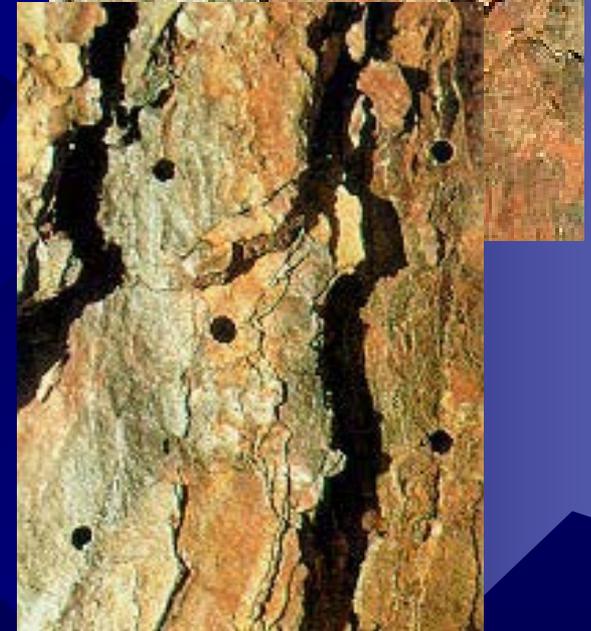
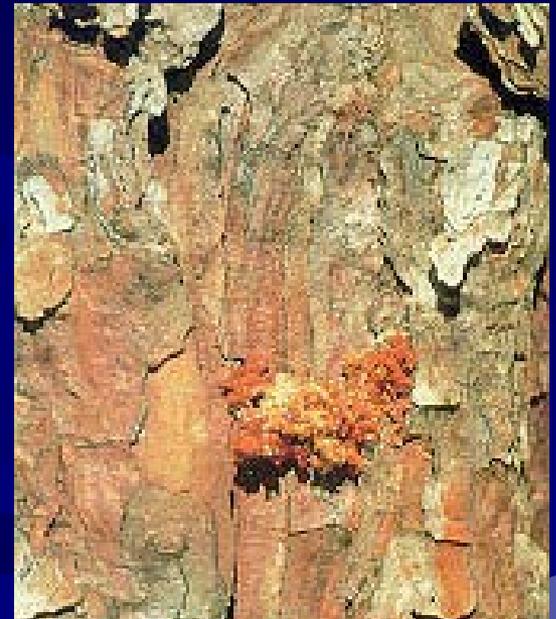
☀ Eastern Fivespined *Ips*

- 5 spines on either side of posterior
- Size in between others
- Attacks middle portion of trunk



Attack Signs

- ☀ 1st sign: yellowing foliage
- ☀ Pitch tubes < ½ in. diameter
- ☀ When tree too stressed, only visible sign is presence of brown dust in bark crevices
- ☀ H, I or Y shaped egg galleries
- ☀ Exit holes look like bird shot



Southern Pine Beetle

- ★ The worst one of the bunch
- ★ Builds up high populations fast
- ★ 3 mm (1/8 inch) long & notched head
- ★ In Arkansas, last outbreak many years ago



Symptoms of Attack

- ✦ Bore into the living bark.
- ✦ Small pitch tube the size of a small piece of popped popcorn.
- ✦ Winding, S-shaped galleries,
- ✦ Blue-stain fungi in the sapwood
- ✦ First indication is discoloration of the foliage

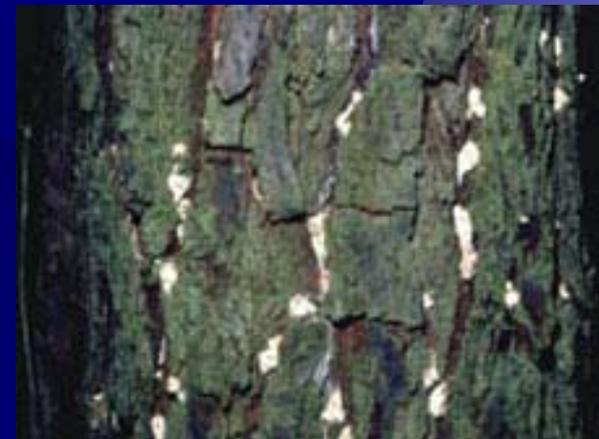


Photo by Forest Insects and Their Damage Photo CD vol. 1 no. 88.
Gerald Lenhard, Louisiana State University.

SPB Continued

- ✱ AFC caught no SPB in monitor traps
- ✱ Plan to begin SPB Detection flights this month
- ✱ No activity W of Miss. River in 10 years
- ✱ Problems E esp. in Alabama and Georgia
- ✱ Drought sets stage for bark beetles

Turpentine Beetle



- Not uncommon to attack largest tree
- The largest in the South
 - Its size (5.0-8.0 mm) makes it easily recognizable.
- Rounded hind end and no spines
- Attacks usually found on lower part of the tree w/ pitch tubes > 1 in. diameter
- Do not carry blue stain



Fall Webworm

- Adults: Small to medium-size moths with wingspan of 1 to 1½ inches
- Larvae: 1 to 1 ¼ inches
- Covered w/silky hairs
- Color varies with a black stripe on the back & yellow strip on side
- 2 generations
- Usually seen in Fall



Eastern Tent Caterpillars

- ☀ Eat foliage
- ☀ No control necessary
- ☀ Can break open tents
- ☀ Don't burn 'em out



Forest Tent Caterpillar

- ★ Larvae: Pale bluish lines form along sides, and white spots (often described as footprints or keyholes) develop along the back. Full-grown larvae are about 50 mm in length.
- ★ Pupae protected by a cocoon spun from pale yellow silk
- ★ Adult moths are light brown with two narrow dark bands on the forewings.



Comparison of Larvae



Oak Defoliators

- ★ Leafrollers
- ★ Walkingsticks
- ★ Skeletonizer
- ★ Oak leaf caterpillars
- ★ Damage can be severe & lead to stress
- ★ Healthy trees recover



Non-Native Pests

- ✦ Gypsy Moth
- ✦ Emerald Ash Borer
- ✦ Thousand Canker Disease
- ✦ Mountain Pine Beetle

Gypsy Moth

- ★ Most important defoliator
- ★ Introduced in 1869 & well established in NE US.
- ★ Isolated infestations in AR
- ★ Most oaks very susceptible
- ★ Hickories & pine moderately susceptible
- ★ Ash, sycamore, poplar, locust least susceptible



Gypsy Moth Detection Survey Plan

- ★ Joint efforts of the Arkansas State Plant Board, the U.S. Forest Service and the USDA APHIS Plant Protection and Quarantine.
- ★ The plan follows the guidelines of the National Gypsy Moth Survey Plan.
- ★ Key agencies responsible for traps
 - Arkansas Dept. of Parks & Tourism, AGFC, AFC, LR Air Force Base, Camp Robinson, Corps of Engineers, UA Cooperative Extension Service, Arkansas Highway & Transportation Dept., NRCS, USFS, National Park Service, Buffalo National River

Three Parts of the Plan

☀ Detection traps

- ☀ Deployed all over Arkansas by cooperating agencies, the Plant Board, and USDA APHIS PPQ.

☀ Trapping in high risk areas

- ☀ Areas where there were catches the previous year

☀ Delimiting trapping in the eradication zone

- ☀ This method not used unless another breeding population is found

Gypsy Moth Traps

Provided by State

- ★ Located in grid pattern
- ★ Delimiting Traps set 36/sq. mile
- ★ Traps contain a pheromone that attracts male moths
- ★ Traps are **NOT** a control device: just a monitoring device
- ★ Moths are then identified as either Gypsy moth or another species



How Worried Should You Be?

- ★ Since 2004, ZERO moths have been caught in the more than 4,000 traps set
- ★ Conditions that favor gypsy moths
 - NW AR has had some isolated spots
 - High density, over-crowded stands
 - Predominately oak
 - Stressed, unhealthy forests
- ★ Campgrounds, truck stops etc.



Emerald Ash Borer

- An exotic beetle discovered in SE Michigan near Detroit in the summer of 2002
- The adult beetles nibble on ash foliage but cause little damage
- The larvae feed on the inner bark of ash trees, disrupting the tree's ability to transport water and nutrients
- Emerald ash borer probably arrived in the United States on solid wood packing material carried in cargo ships or airplanes originating in its native Asia



What's the problem?

- ☀ Killed more than 40 million ash trees in southeastern Michigan alone, with tens of millions more lost in Ohio, Illinois, Indiana, Pennsylvania, West Virginia and Virginia.
- ☀ Caused regulatory agencies and the USDA to enforce quarantines (Indiana, Illinois, Maryland, Michigan, Ohio, Pennsylvania, and West Virginia) and fines to prevent **potentially infested ash trees, logs or hardwood firewood from moving out of areas where EAB occurs.**
- ☀ Cost municipalities, property owners, nursery operators and forest products industries tens of millions of dollars.
- ☀ Has now been found in the Boot Heel of MO

EAB Management Plans

★ USDA quarantines

- ★ Michigan, Illinois, Indiana, Maryland, Missouri, Ohio, Ontario, Pennsylvania, **Quebec**, Virginia, West Virginia, and Wisconsin)
- ★ Fines to prevent potentially infested ash trees, logs or hardwood firewood from moving out of areas where EAB occurs.

★ No EAB in Arkansas yet but State Plant Board and partnering agencies have a plan to monitor EAB

★ National Website:

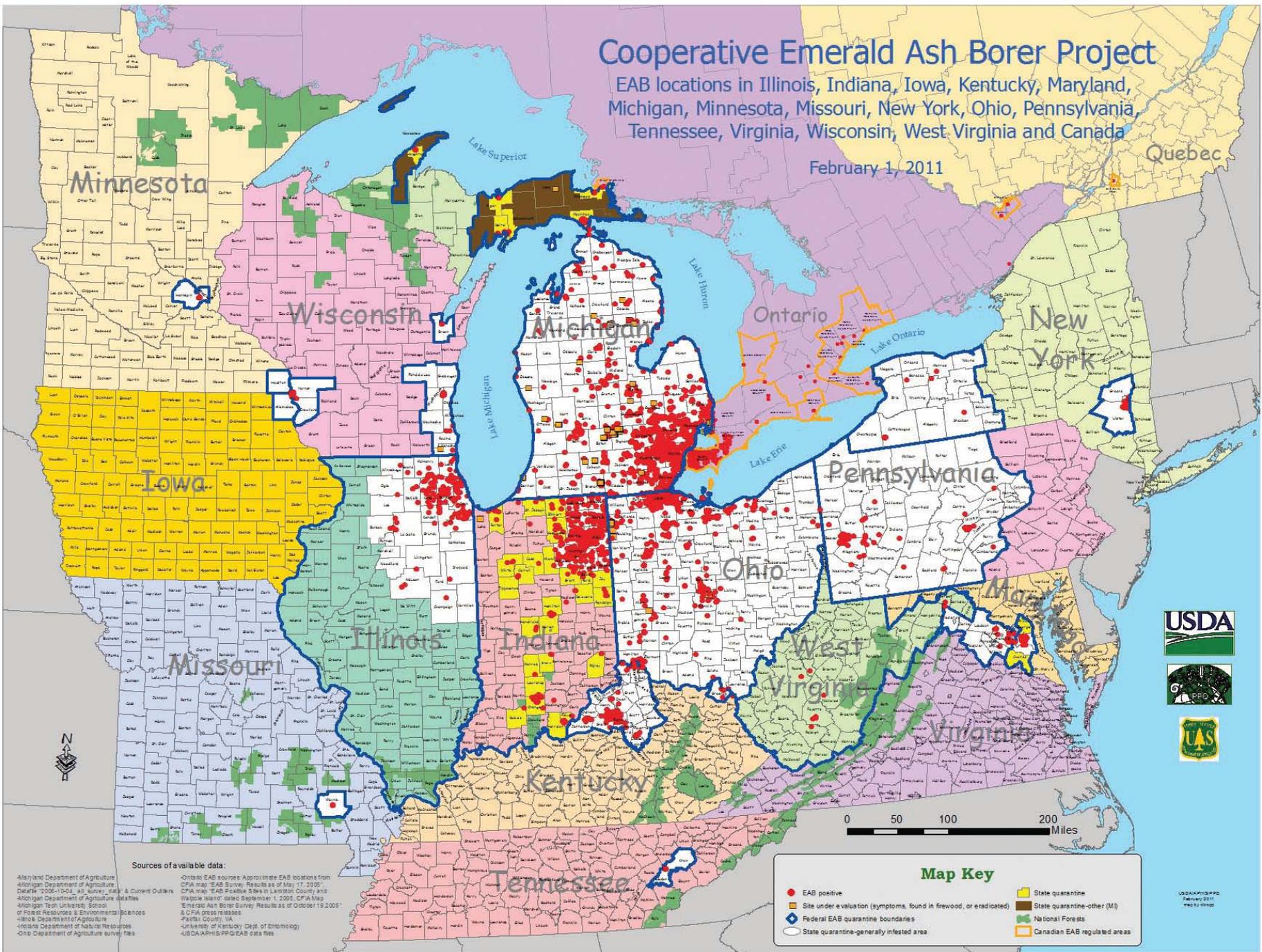
<http://www.emeraldashborer.info/>

Cooperative Emerald Ash Borer Project

EAB locations in Illinois, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Missouri, New York, Ohio, Pennsylvania, Tennessee, Virginia, Wisconsin, West Virginia and Canada

February 1, 2011

Quebec



Sources of available data:

- Maryland Department of Agriculture
- Michigan Department of Agriculture
- Ontario EAB Survey: Approximate EAB locations from CFA map; EAB Survey Results as of May 17, 2009
- CFA map; EAB Positive Sites in Landon County and Wayne County dated September 1, 2009; CFA Map; Emerald Ash Borer Survey Results as of October 19, 2009; CFA press releases
- Penn. County, PA
- University of Kentucky Dept. of Entomology
- USDA/APHIS/PPQ EAB data files
- Illinois Department of Agriculture
- Iowa Department of Natural Resources
- Ohio Department of Agriculture survey files
- Missouri Department of Agriculture
- New York Department of Agriculture
- Ohio Department of Natural Resources
- Pennsylvania Department of Environmental Protection
- Virginia Department of Forestry
- West Virginia Department of Forestry
- Wisconsin Department of Natural Resources

Map Key

- EAB positive
- Site under evaluation (symptoms found in firewood, or eradicated)
- ◆ Federal EAB quarantine boundaries
- State quarantine-generally infested area
- State quarantine
- State quarantine-other (MI)
- National Forests
- Canadian EAB regulated areas



USDA/APHIS/PPQ
February 2011
PMS 11-0100

Thousand Cankers Disease

- ★ A new pest complex could pose a major threat to walnut trees (*Juglans spp.*).
- ★ *The black walnut twig beetle (Pityophthorus juglandis) transmits a Penicillium-like fungus (Geosmithia) cause what is termed “thousand cankers disease.”*
- ★ This disease complex, although not yet detected in Arkansas, is killing large numbers of eastern black walnuts in various western states.



★ **Found in TN in 2010**

Thousand Cankers Disease

- ★ The beetles feed on trees & transmit spores of the fungus to the tree
- ★ At each feeding location, the fungus will form a canker.
- ★ After literally thousands of beetle attacks, the cankers will become so numerous that the tree will decline and die.
- ★ Cankers are not evident on the exterior bark of the tree and initial attacks by the beetle are extremely difficult to detect.

<http://www.thousandcankerdisease.com/>



Mountain Pine Beetle

- ★ Since 1996 more than 5 million acres in US
- ★ BC since 2005 over 40 million acres of pine trees killed
- ★ Estimate 60 to 80 % of pine in BC will be killed in the next 7 years
- ★ Dead trees can be harvested for 5 to 10 years
- ★ 100,000 trees will fall each day in US!

Internet Resources

- ★ <http://www.uaex.edu>
- ★ <http://www.forestpathology.org/index.html>
- ★ <http://www.ces.ncsu.edu/depts/hort/consumer/hortinternet/trees.html>
- ★ http://www.for.gov.bc.ca/hfp/mountain_pine_beetle/facts.htm



Questions?

