

Study shows Appalachian forests have recovered after emissions cut

A collaborative project involving a Kansas State University ecologist has shown that the Clean Air Act has helped forest systems recover from decades of sulfur pollution and acid rain.

The research team – which included Jesse Nippert, associate professor of biology – spent four years studying centuries-old eastern red cedar trees, or Juniperus virginiana, in the central Appalachian Mountains of West Virginia. The region, downwind of Ohio River Valley coal power plants, experienced high amounts of acid pollution – caused by sulfur dioxide emissions – in the last century. By studying more than 100 years of eastern red cedar tree rings, the scientists found that the trees have improved in growth and physiology in the decades since the Clean Air Act was passed in 1970.

“There is a clear shift in the growth, reflecting the impact of key environmental legislation,” Nippert said. “There are two levels of significance in this research. One is in terms of how we interpret data from tree rings and how we interpret the physiology of trees. The other level of significance is that environmental legislation can have a tremendous impact on an entire ecosystem.”

The findings appear in the scientific journal *Proceedings of the National Academy of Sciences of the United States of America*, in

the article “Evidence of Recovery of Juniperus virginiana Trees from Sulfur Pollution After the Clean Air Act.”

The principal investigator on the project was Richard Thomas, professor of biology at West Virginia University. Other researchers include Scott Spal, a master’s graduate from West Virginia, and Kenneth Smith, an undergraduate.

For the study, the scientists collected and analyzed data from cedar trees ranging from 100 to 500 years old. The researchers wanted to better understand the trees’ physiological response and the growth response to long-term acid deposition, or acid rain.

The team focused on red cedar trees because they are abundant, long-lived and a good recorder of environmental variability. Red cedars grow slowly and rely on surface soil moisture, which makes them sensitive to environmental change.

The researchers analyzed the stable carbon isotopes within each tree ring as a recorder of physiological changes through time. Nippert’s Stable Isotope Mass Spectrometry Laboratory at Kansas State University analyzed the samples. Researchers analyzed tree rings back to the early 1900s, when sulfur dioxide deposition throughout the Ohio River Valley began to increase.

Researchers compared the

trees’ growth patterns and changes in physiology to changes in atmospheric chemistry during the 20th century. Results showed that despite increased carbon dioxide – which tends to increase plant growth – tree growth and physiology declined for the majority of the 20th century when acidic pollution was high.

But scientists noticed a dramatic change around 1980, 10 years after the Clean Air Act was enacted.

“Our data clearly shows a break point in 1982, where the entire growth patterns of the trees in this forest started on a different trajectory,” Nippert said. “It took 10 years for that landmark environmental legislation to reduce sulfur dioxide emissions, but it eventually did. When it did, we saw an entire ecosystem recover from years of acidic pollution.”

Results from the Great Depression era in the 1930s were very similar to the results from post-1980 era. Because of the suppressed economy, coal power plants were less productive, which reduced fossil-fuel emissions. Data from the 1930s showed improved tree growth.

“It’s kind of interesting that those two very important periods in our history match up perfectly in terms of the responses seen throughout this whole forest ecosystem,” Nippert said.

Thomas County Jail

Booked into the Thomas County jail:

- Wayne Phillip Coppedge, 27, Topeka, Aug. 23, stalking, Kansas Highway Patrol/Millard County, Utah, released Sept. 4 to other agency.

- John Matthew Frady, 37, Cowpens, S.C., Aug. 23, warrant arrest, Highway Patrol/State of South Carolina, released Sept. 5 to other agency.

- Alan Michael Dible, 28, Colby, Aug. 29, possession/distribution of hallucinogenic drugs, possession of hallucinogenic drugs, using communication facility to arrange sales or purchase, Kansas Bureau of Investigation, released Sept. 5 on \$100,000 appearance bond.

- Max Ray Lingo Jr., 51, Eu-aula, Okla., Sept. 2, driving under the influence, refusal to take breath test, Thomas County Sheriff’s Office, released Sept. 5 on

\$25,000 appearance bond.

- Carlos Alberto Rodriguez, 22, Oakley, Sept. 4, driving with license suspended or revoked, Oakley Police Department, released Sept. 7 on recognizance.

- David P. Block, 43, North Kansas City, Mo., Sept. 5, driving under the influence (third or subsequent), Logan County Sheriff’s Office, released Sept. 7 on recognizance.

- William King Bright, 42, Grainfield, Sept. 5, failure to appear, Gove County Sheriff’s Office, Thomas County Sheriff, released same day on recognizance.

- Kathy Lee Dickeson, 34, Logan, Sept. 5, giving a worthless check, Thomas County Sheriff, released same day on recognizance.

- Matthew W. Headley, 37, King City, Colo., Sept. 6, robbery, Highway Patrol, released same day to other agency.

- Abigail Jacqueline Gifford, 19, Colby Sept. 7, minor in possession/consumption, Colby Police Department.

- Blake Tyler Mayfield, 26, Colby, Sept. 7, probation violation, Colby Police, released same day on recognizance.

- Roger Dale Wright, 52, Oakley, Sept. 7, driving under the influence (second), transporting open container/alcohol, Oakley Police Department, released same day on bond.

- Matthew Allan Shepherd, 30, Oakley, Sept. 9, probation revocation, Thomas County Sheriff/Court Services of Thomas County, released same day to other agency.

- Brandon Michael Smith, 33, Beatrice, Neb., Sept. 11, failure to appear/giving a worthless check, Colby Police, released same day on bond.

Cupcake conversation



SAM DIETER/Colby Free Press

Michelle Morris, left, spoke with Pat Sloan and Chuck Moore in front of a desert-covered table in her studio, Fotogirl Photography at September’s Business After Five event.

Public Notice

NOTICE OF BUDGET HEARING

The governing body of
ROYOHL TOWNSHIP
THOMAS COUNTY

will meet on September 27, 2013 at 8:00 AM at Thomas County Commissioner’s Room Colby, KS for the purpose of hearing and answering objections of taxpayers relating to the proposed use of all funds and the amount of ad valorem tax. Detailed budget information is available at Thomas County Clerk’s Office and will be available at this hearing.

BUDGET SUMMARY

Proposed Budget 2014 Expenditures and Amount of 2013 Ad Valorem Tax establish the maximum limits of the 2014 budget. Estimated Tax Rate is subject to change depending on the final assessed valuation.

Fund	Prior Year Actual 2012		Current Year Estimate 2013		Proposed Budget 2014		
	Expenditures	Actual Tax Rate*	Expenditures	Actual Tax Rate*	Budget Authority for Expenditures	Amount of 2013 Ad Valorem Tax	Est. Tax Rate*
General	67,072	20.724	74,625	16.026	71,050	43,520	12.982
Debt Service							
Library							
Road							
Special Machinery							
Totals	67,072	20.724	74,625	16.026	71,050	43,520	12.982
Less: Transfers	0		0		0		
Net Expenditure	67,072		74,625		71,050		
Total Tax Levied	53,292		43,482		xxxxxxxxxxxxxx		
Assessed Valuation:							
Township	2,571,559		2,713,225		3,352,214		
Outstanding Indebtedness, Jan 1	2011		2012		2013		
G.O. Bonds	0		0		0		
Other	0		0		0		
Lease Purchase Principal	51,909		35,225		17,921		
Total	51,909		35,225		17,921		

*Tax rates are expressed in mills.

John Schroeder
Trustee

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