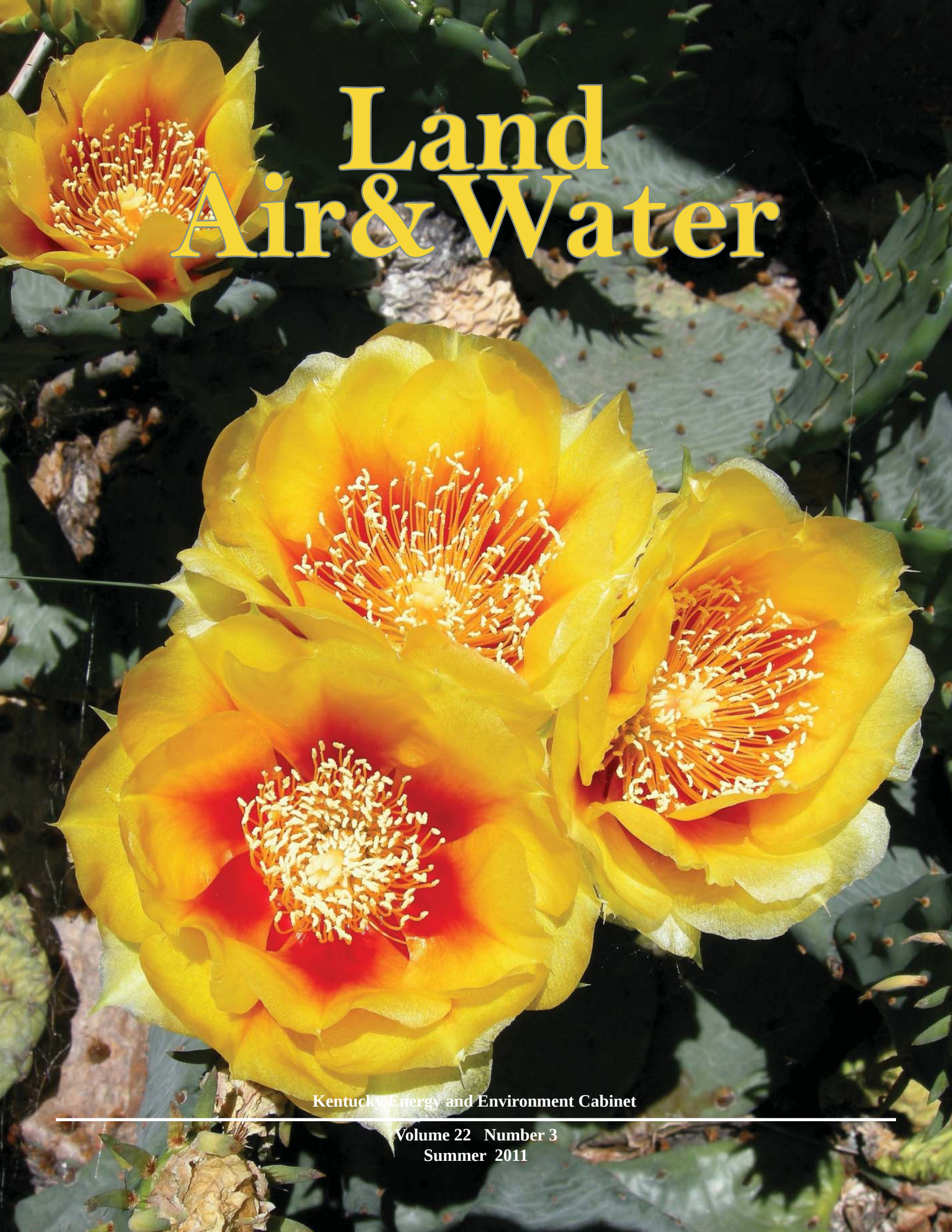

Land Air & Water

Kentucky Energy and Environment Cabinet

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Summer 2011

Land
Air&Water

since 1988

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Agency Coordinators
Roberta Burnes
Allison Fleck
Mary Jo Harrod
Leslie Isaman
Linda Potter
Kimberly Richardson
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Lynn True

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Students "Celebrate Forests. Celebrate Life."

By Lynn True
Division of Forestry

Kentucky's Forest Exchange Box designed and constructed by Phillip A. Sharp Middle School's Environmental Science Club. Photo by Reeda Hart, Northern Kentucky University

The U.S. celebration of the International Year of Forests (IYOF) was officially launched on March 1 as citizens, students and resource professionals joined efforts to recognize the importance of forests. The IYOF campaign was initiated by the United Nations General Assembly which declared 2011 as the year to raise awareness about sustainable management, conservation and sustainable development of all types of forests. The objectives of IYOF are to reverse the loss of forestland, prevent forest fragmentation, enhance economic, social and environmental benefits and increase areas of sustainably managed forests.

The official IYOF campaign is "Celebrate Forests. Celebrate Life." Events and projects will take place year-round with the help and partnership of the U.S. Forest Service, American Forest Foundation and the National Association of State Foresters. A calendar of forest-related events can be found on the IYOF's website at http://www.celebrateforests.org/.

To help bring global attention to America's forests, educators and students across the country have created Forest Exchange Boxes, which showcase unique characteristics of America's woodlands and feature items specific to the woodlands of each state. The boxes, sponsored by Project Learning Tree, will be shown at events throughout the year.

Kentucky's exchange box was designed and constructed by the Environmental Science Club at Phillip A. Sharp Middle School in Pendleton County. Students included natural objects, examples of tree and wood products, tree identification guides, literature, drawings and more to display Kentucky's forest heritage. Through Kentucky's box, and other exchange boxes, students and viewers learn about who owns and manages our forests, what benefits come from forests—like clean air, water, and recreation—and how individuals and communities use, enjoy and depend on forests.

For more information about the forest exchange box program and other IYOF projects, visit http://celebrateforests.com/forest-exchange-box-program.

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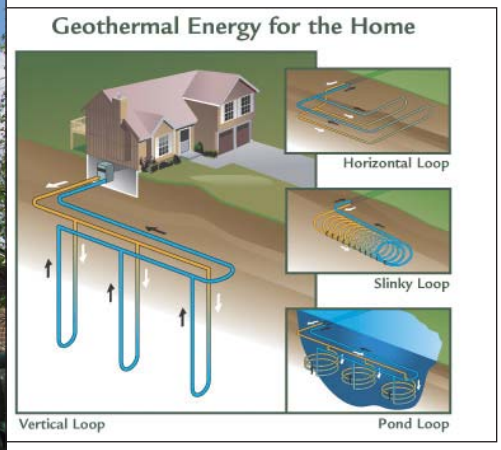
Our Cover

This lovely pricklypear *(Opuntia humifusa)*, a Kentucky native, was photographed in a Frankfort garden by Todd Hendricks of Nelson County.

LEFT: ***A "closed" loop was installed in our yard, which required three 200-foot holes to be bored vertically. The loop field is connected at one central point, passed through our foundation and connected to the unit in our crawlspace.*** Photo by Cindy Schafer

BELOW: ***There are several types of loop systems. A geothermal installation specialist will decide which system is best for your property.***



Geothermal: Why we did it

By Cindy Schafer
Office of Communications and Public Outreach

Hot, dry summers and bone-chilling winters are fast becoming the norm in Kentucky. Last year, the state experienced one of the warmest summers on record followed by below-average temperatures in January and February. These extreme temperatures, coupled with increasing electricity rates, have many homeowners, including myself, looking for ways to reduce their energy expenses.

In May, my husband Joe and I invested in geothermal heating and cooling to replace our aging heat pump. We figured it was the perfect opportunity to do our part for the environment by tapping into a "natural" source that is clean and reliable and will save us money in the long run.

"We did our homework and estimate that we can save as much as 60 percent on our heating, cooling and hot water expenses during peak seasons. We anticipate saving at least $60-$75 a month based on the size of our home," said Joe.

A geothermal or "ground-source" heat pump uses the constant temperature of the earth to heat and cool our home. It works by circulating a water mixture through a series of buried pipes, or "loop," where the temperature in the surrounding soil (between 45 degrees to 75 degrees depending on where you live) either warms or cools the water. The hot or cool air is then distributed throughout our home by compressors and heat exchangers much like the principles of a refrigerator.

In winter, the loop system absorbs the heat from the earth, compresses it through the geothermal unit and distributes it as heat through the ductwork. In summer, the process reverses. Heat is removed from our home, transferred to the loop system where it is cooled by the earth's temperature. In this process, the earth serves as a "heat sink," or a place to deposit heat removed from our home. For every unit of electricity used in this process, four units of energy are produced making it 400 percent efficient, compared to the most energy-efficient gas furnace at 95 percent.

As a bonus, a geothermal unit can assist in pre-heating domestic hot water year-round.

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Geothermal Tax Credits

Homeowners who install geothermal heating and cooling systems can receive a one-time tax credit of 30 percent of the total investment when they install ground loop or groundwater geothermal heat pumps. The systems must meet or exceed ENERGY STAR requirements and must be installed before Dec. 31, 2016.

Tank-raised paddlefish can reel in the dough

from fish fry to the frying pan

By Allison Fleck
Division of Water

For five years, researchers at the Kentucky State University (KSU) Aquaculture Research Center have been successfully using old holding tanks at the Frankfort wastewater treatment plant to raise young paddlefish, known as fry, as a food fish.

Dr. Steven D. Mims, professor and principal investigator at the KSU Aquaculture Research Center who initiated this program, said the decommissioned tanks provide an ideal hatchery environment for paddlefish, which are highly prized for their tasty, boneless meat and high-quality caviar.

"As better methods for processing wastewater have developed in recent years, many communities are now building new, larger facilities and decommissioning the old ones," said Mims. "Many of these, like those at the Frankfort facility, include sedimentation ponds and tanks that could be converted for fish culture. Conversion to fish aquaculture can save local governments thousands in demolition costs while creating new jobs and generating revenue."

Mims said the proximity of many of these new plants to old ones is another plus because the hatchery makes use of the processed water.

"I'm sure a lot of people would think 'yuck' when considering eating fish grown in wastewater effluent," said Mims. "But the reality is that because water being discharged from the plant must meet federal water quality criteria for humans, wildlife and aquatic life, it can actually be lower in contaminants than lake or river water."

Mims said the fish produced in treated effluent have been tested for heavy metals and pesticides and found safe for consumption. The Frankfort plant holds a discharge permit through the Kentucky Division of Water, which regulates effluent

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ABOVE: Rick Onders, co-investigator at the KSU Aquaculture Research Center, holds a mature female paddlefish sampled from a water supply lake in central Kentucky. TOP LEFT: Young paddlefish are emptied into a bin for transport to water supply lakes. LEFT: Daphnia collected from the clarifying tank are fed to paddlefish fry in the decommissioned digester tank. Photos courtesy of Charles Wiebel, KSU

Fred Kirchhoff, who works for Mac's Tire Recycling, removes tires from the Fores property in Bath County. DWM photo

Unsightly tires becoming a thing of the past

Stories by Shannon Powers
Division of Waste Management

Bob and Lori Fore watched as three dump truck loads of waste tires were hauled away from their farm in Bath County. The tires were being transferred to a Waste Tire Amnesty held at the Bath County Road Department.

"We are so excited that the tires are leaving," said Lori. "There were so many of them."

When the Fore family moved from Arizona to their new property more than a year ago, it was summer and the land was lush and green. However, once the leaves began to fall and the fence rows became bare the family noticed tires—and lots of them.

"Our new property was absolutely pristine in the summer, but in the winter you could see tires everywhere—tree lines, fence rows—just everywhere," said Bob. "When you have a good-sized honey locust growing in the middle of a tire, you know these things have been here for quite a while."

Lori searched the Internet hoping to find one-time cleanup grants like the ones that were offered in Phoenix. What she found was the waste tire amnesty schedule on the Kentucky Division of Waste Management's website. More importantly, she found Ricky Solomon's telephone number.

Solomon, who is the supervisor of the Recycling Assistance section, and representatives from Mac's Tire Recycling, the state's contractor for waste tire removal, met with the Fores and saw the extent of their tire troubles. Solomon told them that the state's Waste Tire Program would take care of the problem if the Fores could stage the tires at the edge of their property where dump trucks could pick them up since the road was only one lane wide and graveled.

The Fores moved the tires one by one, transporting them 15 at a time on their all-terrain vehicle. They lost count at 2,000-plus tires. In March, the tires were picked up as promised and disposed of at the Bath County tire amnesty.

Tires still remain hidden in the brush on their farm—some of them so deep they

Continued on Page 14

Illegal tire dumping is 'bad behavior'

Lee County just got a lot cleaner thanks to partnering efforts between its local government and the Kentucky Division of Waste Management (DWM). The county, with a population of nearly 8,000 residents, disposed of 21,200 waste tires—almost three tires per resident—one weekend in February.

The process began when Lee County's Solid Waste Coordinator Sharon Watterson-Jackson received grant funding from DWM to clean up 31 illegal dumps. During the cleanup, a huge accumulation of waste tires was found at two dump sites.

"The amount of tires found was mind-boggling," said Watterson-Jackson. "I guess years ago, dumping was just an approved bad behavior."

Watterson-Jackson contacted the DWM for help, and Recycling Assistance Section Supervisor Ricky Solomon visited the sites and saw an emergency need to remove the tires.

"Even though Lee County was scheduled for a tire amnesty this spring, the sheer volume of tires at these two sites called for immediate action," said Solomon. "The money for the tire removal was there; we just had to set the work into motion."

The county agreed to stage the tires at an old landfill site off of KY Highway 11 for its adequate space, easy access for equipment and hauling trucks, and gated entrance. According to Watterson-Jackson, the solid waste dump crew, which included paid county employees and inmates from the Three Forks Regional Jail, was "in the trenches doing the dirty work" removing the

Continued on Page 14

Franklin County school receives Biofuels for Schools grant

By Mary Jo Harrod
Division of Compliance Assistance

Grant funds will help students focus on conservation and pollution prevention by converting waste oil to biodiesel.

On April 20, 2011, the Franklin County Career and Technical Center (FCCTC) received a check for $5,000 from the Kentucky Biofuels for Schools grant program, made possible by the *TogetherGreen* Fellow Program and the Kentucky Division of Compliance Assistance (DCA). The Audubon Society and Toyota Motor Manufacturing of Kentucky launched the five-year *TogetherGreen* initiative in 2008 to build the promise of a greener, healthier future through innovation, leadership and volunteerism.

"My students are very excited about the biofuels program and see the need for alternative fuels for the future as gas prices climb," says Francis Wheatley, the automotive /diesel instructor at FCCTC in Frankfort. "The students want to be more self-reliant and turn a waste product into a fuel source. The program will also aid students in math, science and agriculture."

Founded in October 2010, the Kentucky Biofuels for Schools program encourages Kentucky high schools to teach, produce and use biofuels within their schools and community and was created by Kenya Stump who is the branch manager for the Environmental Assistance Branch at DCA.

Stump says the purpose of this grant is for a community-focused biodiesel project that engages local students in conservation and pollution prevention while focusing on fundamental science and math concepts. To qualify for this grant, FCCTC demonstrated a multi-disciplinary project with long-term vision, committed to attending training from the Kentucky Biofuels for Schools program and received commitments from three community partners to support the project.

"The FCCTC project offers vocational students the perfect environment to discover science, learn about energy conservation and teach essential green job training skills," says Stump. "When students learn core concepts using biofuels, everyone benefits, including the environment. We hope that FCCTC will be a model program for other schools in Kentucky."

For its project, FCCTC will install a mobile biodiesel processor created especially for it by Loyola University's Biodiesel Program. Loyola University, located in Chicago, is a partner with the Kentucky Biofuels for Schools program. FCCTC will use waste oil from the district school cafeterias to convert to biodiesel. This biodiesel will eventually be used in district diesel-burning equipment. In addition, FCCTC will develop curriculum guides and an instructional DVD and be a model for other schools. Because of this commitment, FCCTC has been recognized as the first technical center to become an advocate member of KY EXCEL, Kentucky's environmental leadership program.

There will be approximately 90 automotive and diesel students working on this project, along with some science students, totaling 200 or more, all ranging in age from 14–19.

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ABOVE: ***Francis Wheatley and his students look over the equipment they will use to produce biofuels.***

RIGHT: ***Kenya Stump (second from left) presents the grant check to Automobile/Diesel Instructor Francis Wheatley, Principal Karen W. Schneider and Superintendent Harrie Lynne Buecker.***
DCA photos

Soil erosion and Water quality cost share valued by Kentucky landowners

By Johnna McHugh
and Crystal Renfro
Division of Conservation

The Kentucky Soil Erosion and Water Quality Cost Share Program provided assistance in funding this stream crossing in Hickman County. Photo by Debra Seltsman

The Kentucky Soil Erosion and Water Quality Cost Share Program has assisted landowners with protecting their soil and water resources since its creation in 1994. The program provides financial assistance for the installation of best management practices that include animal waste control facilities, animal waste utilization, vegetative filter strips, sinkhole protection, heavy use area protection, rotational grazing system establishment, livestock stream crossing and riparian area protection.

During the last two decades, more than 17,000 applications have been received from landowners in all 120 Kentucky counties, and $121 million has been approved for use.

To meet the changing demands of Kentucky's landowners, the program has incorporated three new best management practices, which offer incentive payments to approved landowners. The practices include on-farm fallen animal composting, the precision nutrient management incentive and Comprehensive Nutrient Management Plan assistance.

• Fallen animal composting became more commonplace after the Food and Drug Administration made changes in 2008 to regulations regarding proper disposal of farm animals. The Soil and Water Conservation Commission saw this as an opportunity to offer an incentive payment to landowners who construct composting facilities as an alternative method for disposal of animal mortalities. In addition, through state cost-share environmental grants, the commission helped more than 57 conservation districts provide a communitywide fallen farm animal pick-up and disposal program.

• The precision nutrient management incentive applies to landowners who live in the Mississippi River Basin Initiative's targeted watersheds. The incentive payment is designed to encourage the adoption of variable-rate application of nutrients and pesticides while also promoting the use of GPS-enabled precision agricultural technology and equipment. This new approach in agriculture will impact the amount of nutrients and pesticides affecting water bodies across the state.

• The Certified Nutrient Management Plan was added to the agriculture waste control practice. The plan is a prerequisite for all producers who store or apply animal waste on their farm operations. The incentive payment assists approved landowners with paying for the creation of this plan from a certified technical services provider.

During two sign-up periods for fiscal year 2010-2011, the program received 4,500 applications requesting $34 million in assistance. Overall, 1,044 applications were approved, and nearly $8.7 million granted in assistance.

"Kentucky's state cost share program is one of the most successful in the nation in helping landowners address environmental concerns, implement their Agriculture Water Quality Plans, and equally as important, allow the Commonwealth to leverage other federal, state, local and private funds to address conservation concerns across Kentucky," said Steve Coleman, director of the Division of Conservation.

During the first four months of 2011, nearly $675,000 has been paid out to Kentucky landowners for installing approved practices.

The Kentucky Soil Erosion and Water Quality Cost Share Program is funded by the Kentucky General Assembly through direct appropriations from the Tobacco Settlement Funds and from funds provided by the Kentucky Department of Agriculture. The program is administered by the Soil and Water Conservation Commission with administrative assistance by the Division of Conservation. For more information about the state cost share program, visit http://conservation.ky.gov/Pages/StateCostShare.aspx

Energy in Education Collaborative

Partnership combines energy management and education professionals who focus on the design, construction and operation of energy-efficient sustainable schools

By Brooke Smith
Department for Energy Development and Independence

A Fayette County student participates in the school recycling program.
Photo provided by the Kentucky Environmental Education Council

The phrase 'times are tough' is not just a cliché. At school districts across the Commonwealth, budgets have been dramatically slashed throughout K-12 levels, and school administrators have been forced to look for solutions, one of which has been hiding under their noses for years—energy reduction.

Kentucky has more than 100 ENERGY STAR-labeled schools that save their districts energy costs and allow them to put those savings back into their school systems for teachers and curriculum. School administrators are quickly learning that high-performance, energy-efficient school buildings are the way to go.

To further enhance energy education in Kentucky school districts, the Department for Energy Development and Independence (DEDI) used Recovery Act funds to create the *Energy in Education Collaborative*, a partnership of seasoned energy management and education professionals that involves several programs and projects. The elements of the collaborative are designed to be a comprehensive, holistic approach, focusing on energy and sustainability issues in the design, construction and operation of energy-efficient sustainable schools as well as addressing educational/curriculum opportunities. The following describes how each partner is contributing to the collaborative:

School Energy Managers Project (SEMP)

SEMP, administered by the Kentucky School Boards Association, uses Recovery Act funding to pay a portion of the salary (75 percent the first year and 50 percent the second year) of 35 energy managers serving 130 school districts. Energy managers are responsible for coordinating energy efficiency and sustainability programs within the district. SEMP also helps fund energy curriculum coordinators at four districts that already have full-time energy managers. "I am so excited that the energy managers, the 'boots on the ground,' at a time of severe financial challenges for districts, are producing significant monetary benefits during the early stages of this project," said Ron Willhite, who leads the Kentucky School Energy Managers Project.

Kentucky Energy Efficiency Program for Schools (KEEPS)

KEEPS, administered by the Kentucky Pollution Prevention Center at the University of Louisville J.B. Speed School of Engineering, provides technical consulting services to Kentucky's 174 public school districts. It also supports SEMP managers, conducts energy assessments of schools, produces training workshops for energy managers and assists energy managers in establishing energy teams and implementing a structured energy management program using the proven ENERGY STAR model. "The Energy in Education Collaborative encourages engagement throughout our Commonwealth's school districts, including curriculum-based environmental and energy-based education," said Fred Byrd, KEEPS program manager. "This way, a true environment for culture change exists. Together, we are creating a new generation of citizens who are engaged, educated and compassionate about these issues."

Kentucky National Energy Education Development (NEED) Project

Kentucky NEED is part of a national nonprofit organization that focuses on energy curriculum development. NEED provides energy workshops for teachers, grade-appropriate curriculum materials and kits for energy activities in the classroom. NEED assists schools with the formation of student-based energy teams that look at how energy is used in the school. NEED also works with DEDI to produce an annual High Performance School Buildings Workshop for architects, engineers and school officials that focuses on the best practices for design of new, energy-efficient schools.

Kentucky Green and Healthy Schools (KGHS) Program

KGHS is administered by the Kentucky Environmental Education Council in the Education and Workforce Development Cabinet. This inquiry-based program uses the entire school grounds as a learning laboratory for students to conduct inventories in nine different areas, including energy, solid waste and water. The students develop and implement improvement projects in each area, receiving awards and recognition as certain milestones are achieved. "The Energy in Education Collaborative funding has provided a tremendous opportunity for the Kentucky Environmental Education Council and its flagship program, Kentucky Green and Healthy Schools," said Elizabeth Schmitz,

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Putting on a ...
Clean Air Kid's Camp

LEFT: "How far can I go on a gallon of gas?" Jacob Alteri, age 8, holds a gas token as he paces off the miles per gallon for his 'virtual' vehicle.
BELOW: "Does car exhaust contain carbon dioxide?" Emmanuel Markin, age 10, releases a balloon filled with car exhaust into bromothymol blue, which can indicate the presence of C02.
BOTTOM: Kasey Montgomery, age 8, peers through a lens at the Clean Air Kids Camp. Photos by Jon Trout

The Kentucky Division for Air Quality (DAQ) recently offered a day camp to educate employees' children about air quality issues. The camp provided kids with an inside look at what their parents do and also offered a training opportunity for education and outreach staff.

"The idea of a day camp for kids grew out of a desire to share with our own employees what we offer to the public," said DAQ Director John Lyons. "Providing quality educational experiences helps students understand the connections between human activities and air quality."

Even though air is all around us, we can't really see it or touch it.

"We tend to take clean air for granted," said DAQ Environmental Education Specialist Roberta Burnes. "Air quality is a challenging subject because in many ways it's so abstract. Environmental education provides some great tools for bringing air quality down to earth, by incorporating activities that teach across disciplines and different styles of learning."

For the first-ever Clean Air Kid's Camp, it was decided to start small and offer a half-day experience during winter break when kids were out of school.

Division staff were emailed to determine how many parents had children who might be interested in attending the camp. The response was overwhelming, and 18 kids ranging in age from 7 to 14 signed up.

The goals of the camp included:

- Making air quality relevant and fun for students.
- Providing kids an inside look at what their parents do.
- Allowing parents to do their jobs while their children learned about air quality.
- Giving education staff a chance to brush up on activities and try out new ones.
- Helping staff and kids get to know each other.

Short, fast-paced activities, held indoors as well as outdoors, emphasized hands-on learning. Topics included air pollution, air monitoring, asthma, carbon sinks and sources, fuel economy and the carbon cycle.

In many ways, the Clean Air Kids Camp served the same function as "Take Your Kid to Work Day." However, the kids camp provided more in-depth learning opportunities than simply taking kids to work. By exploring

Continued on Page 19

Geothermal: Why we did it *Continued from Page 1*

"We added a second water heater, which serves as a holding tank for additional hot water when we need it," said Joe. "The system should generate a majority of the hot water we need, basically free, adding to our energy savings."

Homeowners can expect to spend about 50 percent more for geothermal compared to traditional units. However, with the current 30 percent tax credit, geothermal installation comes to within a few thousand dollars of the cost of the highest efficiency standard heat pump. Plus, with geothermal, they can expect reduced energy bills, higher reliability and long life from the system. Despite the costs, geothermal can pay for itself within five to 10 years.

"We also like the quietness of our geothermal system. The noisy outdoor unit is gone, which also enhances the outside appearance of our home," continued Joe. "We feel good knowing we are heating and cooling using an unlimited supply of energy from our own backyard…or in our case, side yard where the underground loop system was installed."

Our geothermal unit and pump (mounted on the foundation blocks) circulate water through a series of loops that run underground where the constant temperature of the earth cools our home during summer months.
Photo by Cindy Schafer

Geothermal will benefit us by lowering our utility bills, but most importantly will benefit the environment by reducing our dependency on fossil fuels through coal-generated electricity, thereby reducing our household's carbon footprint.

For us, switching to geothermal was the smart thing to do.

from fish fry to the frying pan *Continued from Page 2*

from wastewater treatment plants.

The process begins when paddlefish fry are placed in old 300,000-gallon concrete tanks originally used as digesters. Inside the tanks, the tiny paddlefish live in water disinfected with ozone and feed on the zooplankton *Daphnia*, commonly known as water fleas. Daphnia are often found in active clarifier tanks as sludge settles to the bottom. Daphnia can be problematic for wastewater plant operations. The tiny crustacean feeds on bacteria and agitates the sewage sludge, sometimes keeping part of it from settling. When millions of them come together in masses, plant operations can be disrupted and may lead to permit violations. However, the problem has been turned into free food for the developing paddlefish, as researchers harvest the daphnia and transfer it to the digesters as a fish feast.

"Daphnia are a great food source for young fish for their first 30 to 40 days," said Mims. "What's more, daphnia can't survive in water containing toxic materials like lead and pesticides, so their presence in high densities is an indicator of good water quality."

From the time the fish are stocked into the tank as fingerlings in May, the fish grow to nearly a foot in length by September and can be released to Kentucky water supply lakes as stocker fish. Mims said taste tests have given high marks to the harvested fish.

"In a blind test to 13 chefs from high-end restaurants in the southeast, all but one said they would serve it in their restaurants," said Mims.

Tim Parrot, president of Aquila International Inc., worked alongside KSU researchers and developed a stocking program for municipalities to participate in reservoir ranching using their water supply lakes and producing paddlefish for meat and black roe to make into caviar.

The Madisonville City Council was an early supporter of the tanks-to-lakes paddlefish plan. In 2007, the city council voted to stock two public lakes with the tank-raised paddlefish. When the fish are harvested as meat and caviar in another couple of years, city officials hope to make some money.

"It would be great to get some income from the sale of the paddlefish in a couple years, but we believe we've already benefited from the program," said Mike Franklin, superintendent of the Madisonville Water Filtration Department. "They gave us the fish to stock two lakes—Lake Peewee, our main drinking water supply lake, and Grapevine Lake. In the last few years, we have seen a sharp decline in algae blooms. That means we save money on copper sulfate, which is used in the drinking water treatment process when the blooms develop in summer. We're looking at stocking the fish in two other recreational lakes. Even if the drop in blooms is coincidental, the paddlefish are good eatin'."

Mims hopes more municipalities will begin using abandoned sewer tanks to grow paddlefish.

"We encourage utilities to consider joining in on this pioneer industry that should be a win-win situation for all parties involved," said Mims. "Reuse technology can provide economically viable opportunities to grow healthy fish in a sustainable process."

For more information on the paddlefish project, email steven.mims@kysu.edu. The project has been partially funded by the Kentucky Science and Engineering Foundation and the Kentucky Science and Technology Corporation.

Arbor Day celebrations

By Lynn True
Division of Forestry

Earlier this year, Gov. Steve Beshear proclaimed April 1, 2011 as the 115th Arbor Day, continuing a long tradition of observing the first Friday in April as Kentucky's Arbor Day. To celebrate the event, Kentucky First Lady Jane Beshear joined the Kentucky Division of Forestry in planting an American Hornbeam on the grounds of the Governor's Mansion. Mrs. Beshear noted the importance of celebrating Arbor Day in the Commonwealth's communities.

"Arbor Day is a reminder that we need to protect and properly care for our trees because of the benefits they provide, like shading our city streets and sidewalks and saving on energy costs."

Leah MacSwords, director of the Division of Forestry, opened the ceremony by acknowledging the importance of environmental stewardship and Arbor Day in Kentucky.

"Conserving our natural resources is a priority of this administration and for all citizens. I am pleased that Kentuckians plant nearly a half million trees as an act of good stewardship and in celebration of Arbor Day throughout the month of April," said MacSwords.

During the event, Bluegrass Energy—the newest Tree Line USA—and Centre College, University of Louisville and Western Kentucky University—the newest Tree Campus USA winners—were recognized for their efforts to protect and enhance urban and community forests. Tree Line USA recognizes public and private utility companies that promote safe, reliable electric service in conjunction with healthy trees across utility areas. Tree Campus USA recognizes college and university campuses for effectively managing campus trees and fostering urban forestry programs.

For more information about the state ceremony or other Arbor Day events, contact the Kentucky Division of Forestry at 1-800-866-0555 or visit the Arbor Day Foundation's website at http://www.arborday.org/.

LEFT: ***An American Hornbeam planted at the Governor's Mansion.***
ABOVE: ***Luke Saunier with one of the winners of the poster and essay contest.*** Photos by Lynn True

Ft. Thomas students celebrate Arbor Day; 20 years as Tree City USA

Students in the city of Ft. Thomas have a greater understanding and appreciation for Arbor Day and urban forests thanks to Luke Saunier, a Division of Forestry forest ranger technician.

Saunier (opposite page), who has a keen interest in forestry education and a natural ability to teach children about the importance of trees and forest ecosystems, recently spent time with students in each of Ft. Thomas' elementary schools.

"Students from Johnson, Ruth Moyer, St. Catherine, St. Thomas and Samuel Woodfill participated in the one-hour program, and after learning about the value of trees, they were encouraged to enter a poster or essay contest," said Saunier.

"There were over 60 contest entries, and that is a testament to the students as well as the community. This city has beautiful parks and a history of planting trees and maintaining community forests," noted Saunier.

The city of Ft. Thomas has been involved in community forestry for many years. In fact, this year marks its 20th year in the Tree City USA program—a national program sponsored by the Arbor Day Foundation and the National Association of State Foresters. An event was held at Tower Park to commemorate the city's participation in the Tree City USA program, as well as to celebrate Arbor Day and announce the winners of the contests. Essay winners Garrett Harrison, Maura Juenger and Gabriel Powell and poster winners, Margot Seidel, Carly Lorenz and Karli Baioni were presented with wooden plaques. In addition, students assisted with planting a yellow-poplar.

DNR Joins James River Coal and the Office of Surface Mining to Celebrate Arbor Day

By Linda Potter and Paul Rothman
Department for Natural Resources

On May 4, more than 100 students and their teachers from R.W. Combs Elementary in Perry County, along with student members of the Future Farmers of America, the Boy Scouts and students from the Lexington Catholic Beta Club planted over 700 native hardwood seedlings and a large number of wetland plants to aid in reforestation and wetland creation on mined lands. The students also learned how to create forest-based pollinator habitat for honey bees and other insects.

The event was hosted by the James River Coal Co. on its surface coal mining operation located near Vicco, Ky. Students planted tree species that included American chestnut, northern red oak, chestnut oak, red bud, gray dogwood, butternut hickory, yellow poplar and swamp white oak. With the exception of the American chestnut, the tree seedlings came from Kentucky Division of Forestry state nurseries.

One mini-workshop led by Tom Biebighauser of the U.S. Forest Service focused on building forested wetlands on mine sites and provided the students with a hands-on opportunity to plant wetland species around several seasonal wetlands constructed on the mine. Another mini-session was led by Dr. Tammy "Bee Lady" Horn of Eastern Kentucky University and focused on establishing bee habitats on mined lands by planting trees and plants that they prefer. A poster contest for R.W. Combs Elementary students was hosted by Coal Mining Our Future. The top three entries received $100, $75 and $50 in savings bonds. All participants were given a white pine seedling to take home and plant in their yard.

Reforestation of previously mined lands has been encouraged in Kentucky since the Department for Natural Resources (DNR) and the University of Kentucky began promoting and researching its viability in 1996. When mine sites are reclaimed per DNR guidelines, the resulting outcome can be greater tree growth and survival rates than one may find on some virgin forest soils. Planting native Appalachian hardwoods can provide landowners with a sustainable source of income, recreational opportunity, improved water quality and offers habitat for forest animals.

Wetlands construction and bee colony establishment are relatively new partnerships that complement the reforestation initiative by interspersing wetland areas and planting tree and ground cover types that bees prefer on these sites. Water fowl, dragonflies, frogs and salamanders now gravitate to the wetlands, providing another natural feature to the previously mined lands.

During the event, DNR Commissioner Carl Campbell presented the 2010 Kentucky Appalachian Regional Reforestation Initiative Award to Heritage Coal Co. LLC for "Excellence in Reforestation" on their Ohio County surface mining operation.

"The reforestation of Kentucky surface mining operations is of primary importance and a long-term goal of DNR," said Campbell. "I am pleased with the ongoing reforestation efforts of James River Coal Co. and other progressive companies in the coal industry, the University of Kentucky, Eastern Kentucky University and all other state and federal agencies who have partnered with us to achieve substantial progress with this goal."

New EPA rules target hazardous air pollutants from boilers

A wood-fired boiler at Kincaid Furniture. Photo provided by Industrial Boiler & Mechanical Co., Chattanooga, Tenn.

By Roberta Burnes
Division for Air Quality

On Feb. 21, 2011, the Environmental Protection Agency (EPA) finalized two rules that will reduce emissions of toxic air pollutants from existing and new industrial, commercial and institutional boilers. Collectively known as the "Boiler MACT," the rulemaking will require the use of Maximum Achievable Control Technology (MACT) to reduce hazardous air pollutants from boilers at both major and smaller "area source" facilities. The Boiler MACT will not cover electric generating utilities, which have their own "Utility MACT" that governs emissions of hazardous air pollutants (HAPs).

Protecting Human Health and the Environment

This rulemaking will reduce toxic air pollutants, also known as hazardous air pollutants (HAPs) or air toxics. Air toxics are among the most dangerous pollutants to human health and the environment. HAPs include hundreds of compounds and heavy metals known to or suspected of causing cancer and other serious health and environmental effects. Once released, many toxics like dioxins, lead and mercury can be passed through the food chain and accumulate in body tissue. Children and pregnant women are particularly vulnerable; mercury and lead can adversely affect developing brains – including effects on IQ, learning and memory.

Air toxics pollute more than just air. For example, mercury begins as an air-borne pollutant but ultimately settles out of the air into waterways where it enters the food chain. Smaller fish exposed to mercury are eaten by larger fish; eventually, fish can accumulate unhealthy concentrations of mercury in their tissue. For this reason, Kentucky is one of 31 states that have issued a statewide fish consumption advisory due to unsafe levels of mercury in streams and lakes. For information on Kentucky fish consumption advisories, visit http://fw.ky.gov/fishadvisory.asp.

Boiler MACT Basics

Two categories of boilers will ultimately be affected by the Boiler MACT rules. Boilers at *major source* facilities are those emitting 10 tons per year or more of a single HAP or 25 tons per year of any combination of HAPs. EPA estimates that approximately 13,800 of these boilers will be affected by the Boiler MACT. Most are located at large industrial or manufacturing plants.

Industrial, commercial and institutional boilers located at *area source* facilities are also covered by the rulemaking. These sources emit or have the potential to emit less than 10 tons per year of any single air toxic or less than 25 tons per year of any combination of air toxics. EPA estimates some 187,000 boilers at these smaller sources will be affected, including boilers located at universities, hospitals, hotels and smaller commercial facilities.

When Will the Rules Take Effect?

The Boiler MACT has had a bumpy history since its original promulgation in 2004. After being vacated by the D.C. Circuit Court in 2007, EPA proposed a revised ruling

Continued on next page

***Boilers** burn coal, oil or biomass (such as wood or switch grass) to produce steam or hot water that is then used for energy or heat. Boilers emit a variety of pollutants including hazardous air pollutants, particle pollution and volatile organic compounds (VOCs). Emissions from boilers depend on the type and quantity of fuel burned, the type of boiler and emissions controls.*

Energy in Education Collaborative *Continued from Page 6*

executive director of Kentucky Environmental Education Council. "Interest in the program has grown exponentially, with a 196 percent increase in enrollment in 2011, as compared to 2010. We have given out $19,325 in grant funds to 28 schools in 15 counties. Students and teachers at these schools have used the Recovery Act funds to implement 38 energy-saving improvement projects, while learning about energy and ways to conserve it. In addition, the network provided through the Energy in Education Collaborative has been invaluable in improving communication among the many partners involved, and I am confident that the collaborative will find ways to work together after April 2012, when Recovery Act funds are gone," Schmitz continued.

Net Zero Energy Schools

This project involves two newly constructed schools that were occupied last fall—Richardsville Elementary School (Warren County) and Turkey Foot Middle School (Kenton County). Both schools were designed to be energy efficient and are projected to use about one-fourth as much energy as the typical school that meets Kentucky's building energy codes. DEDI awarded Richardsville Elementary $1.3 million and Turkey Foot Middle $2 million to help pay a portion of the cost to install sufficient photo-voltaic solar capacity to make each a net-zero energy school—among the first in the nation to achieve such a feat.

An additional unfunded partner is the Kentucky School Plant Management Association, which provides training and workshops on energy efficiency to school facilities personnel and fosters the exchange of best practice information among peers.

The *Energy in Education Collaborative* is making an immediate impact because it provides schools with a "total package" that addresses all of their energy-related needs, including on-the-ground staff devoted to energy management, training and technical consulting expertise and education curriculum, and student involvement in energy management that enhances the learning process for all involved.

Energy in Education Collaborative Partners

School Energy Managers Project: http://www.ksba.org/energy-management
Kentucky National Energy Education Development Project: www.need.org
Kentucky Energy Efficiency Program for Schools: https://louisville.edu/kppc/keeps
Kentucky Green and Healthy Schools Program: http://greenschools.ky.gov

New EPA rules target hazardous air pollutants from boilers

Continued from previous page

in 2010. EPA received more than 4,800 comments on the proposed rule, many representing industry concerns about the cost of pollution control equipment upgrade and compliance. Due to the volume of comments, EPA requested an extension of the final rule deadline until April 2012. The court denied EPA's request and set a deadline of Feb. 21, 2011, for the final rule to be promulgated.

EPA finalized the Boiler MACT rules on Feb. 21, 2011, to meet the court ordered deadline. However, EPA also published a reconsideration notice to further evaluate the rules. On May 16, 2011, EPA delayed implementation of the major source rule indefinitely. EPA said the stay would "allow the agency to seek additional public comment before requiring thousands of facilities across multiple, diverse industries to make investments that may not be reversible if the standards are revised following reconsideration and a full evaluation of all relevant data."

The delay did not affect minor or area sources; the area source boiler rule went into effect on May 21, 2011.

Benefits and Costs of the Boiler MACT

The Boiler MACT rules will significantly reduce HAP emissions from boilers burning coal, oil or biomass. EPA estimates that the final rules (both major and area source) will reduce nationwide emissions from existing and new boilers by approximately:

- 1.5 tons per year (tpy) of mercury
- 3,020 tpy of nonmercury metals
- 30,000 tpy of hydrogen chloride
- 49,500 tpy of particulate matter
- 440,000 tpy of sulfur dioxide
- 7,000 tpy of volatile organic compounds

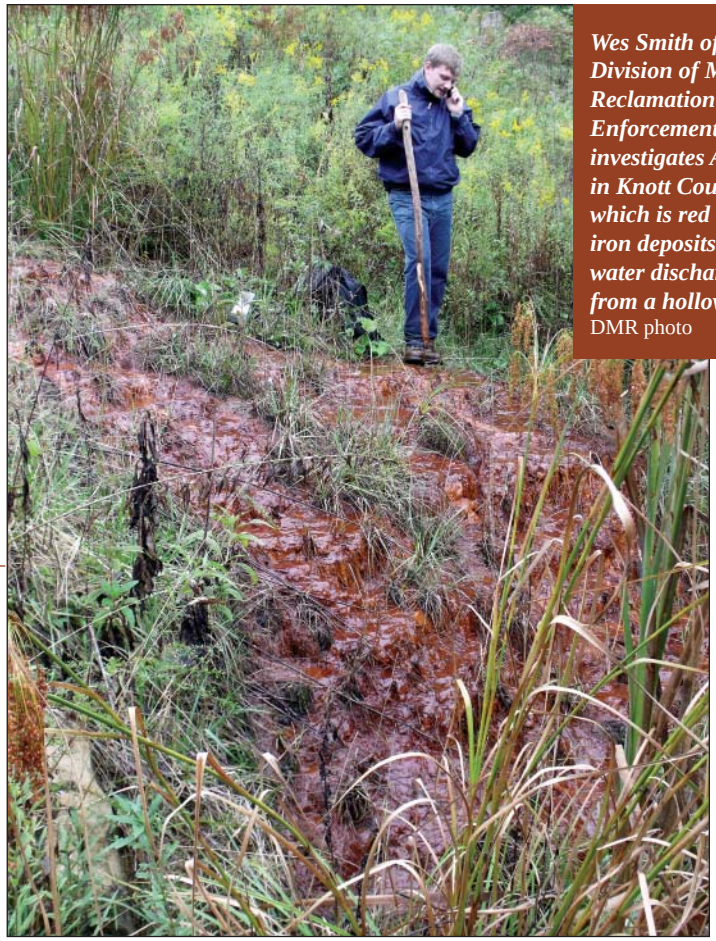
These emissions reductions will lead to significant annual health benefits. Once the rules become effective, EPA estimates the Boiler MACT will protect public health by avoiding thousands of premature deaths, emergency room visits, nonfatal heart attacks, cases of acute bronchitis and aggravated asthma, and thousands of days of lost work or school.

EPA estimates the total cost for installing and maintaining controls under this ruling to be just under $2 billion. To help offset some of the initial cost, major source facilities will be required to conduct a one-time energy assessment to identify cost-effective energy conservation measures. EPA has limited the impact of the final rulemaking on smaller facilities by requiring only existing coal-fired boilers meet emission limits for mercury and carbon monoxide; establishing work /management practices instead of emission limits for existing small coal-fired boilers (less that 10 million Btu per hour of heat input) and all existing biomass and oil-fired boilers; and exempting most area source boilers from Clean Air Act title V permit requirements.

Long-Term Treatment List

Inventory of coal mining permits helps cabinet reviewers track substandard water problems and bond requirements

By Gordon Bowers
Division of Mine Reclamation and Enforcement



Wes Smith of the Division of Mine Reclamation and Enforcement investigates AMD in Knott County, which is red due to iron deposits from water discharging from a hollow fill. DMR photo

Acid mine drainage, or AMD, forms when rocks containing sulfide minerals are exposed to oxidizing conditions. This exposure can occur through any type of excavation whether it is related to construction or mining, but most commonly occurs as the result of coal or metal mining activities. AMD mars the natural beauty of Kentucky's streams, increases the total dissolved solids found in ground and surface water, and can artificially increase or lower the pH of natural waters.

In 1994, the federal Office of Surface Mining (OSM) and the Kentucky Department for Surface Mining Reclamation and Enforcement (DSMRE), now Division of Mine Reclamation and Enforcement, entered into a performance agreement to prevent AMD from occurring at regulated mining activities. An initial study of selected AMD-producing sites in Kentucky was undertaken and produced several recommendations.

A primary recommendation was the creation of an AMD inventory that was computerized, GIS-based and readily available to reviewers during the permit review process. The initial AMD policy was instituted in January 1998, and through subsequent modification, the inventory became the Long-Term Treatment List.

All coal mining operations in Kentucky are required to have a Kentucky Pollutant Discharge Elimination System (KPDES) permit issued by the Division of Water before a permit to mine is issued. The Long-Term Treatment List is an inventory of all Kentucky coal mining permits that produce water requiring some form of treatment to meet any KPDES permit requirement, even if only intermittently. Once a permit has been identified as producing substandard water, it is added to the inventory and the Division of Mine Permits is notified to review its bond requirements. If the division determines that the substandard discharge can not be remediated during site reclamation, it will increase the bond required for the permit to allow for water treatment.

Permits that are included in the Long-Term Treatment inventory are not eligible for bond release. However, any site that does not require treatment to meet KPDES permit requirements for 12 consecutive months becomes eligible for removal from the inventory, refund of its increased bonding requirement, and bond release if all other reclamation requirements have been met.

In addition to the inventory of sites currently treating substandard discharges, called the active list, a historical list of all sites that have been removed from the active list is also maintained as a part of the Long-Term Treatment inventory. The combined active and historical lists are a valuable resource when trying to determine potential problem areas for substandard discharges. It is available as a GIS layer, allowing easy access when reviewing new or amended permit applications. As a GIS layer, all aspects of the inventory are available with a simple mouse click, including the source of the discharge, why the discharge is substandard, the method of treatment, whether bonds were adjusted, and the dates of addition and removal from the active inventory.

The Kentucky Long-Term Treatment List is a valuable resource in the divisions of Mine Reclamation and Enforcement and Mine Permits' efforts to prevent AMD and minimize the impacts from mining on the environment. During the 13 years of the AMD policy's existence, 327 mine permits have been added to the active Long-Term Treatment List, with 237 of those permits later being removed when the substandard discharge improved or was eliminated all together.

The Long-Term Treatment List, and the repercussions to permit holders on the list, is instrumental in the Department for Natural Resources' efforts to regulate the mining industry and protect the environment and citizens of the Commonwealth.

Gallatin Steel hosts Environmental Field Day

By Lynn True
Division of Forestry

Each spring Gallatin Steel, a steel manufacturing company and major recycler of scrap metal in northern Kentucky, celebrates Earth Day by giving back to the community. Workers at Gallatin Steel, along with local natural resource professionals, provide an environmental field day for fourth-graders in Carroll and Gallatin counties.

Pat Underwood, environmental coordinator for Gallatin Steel, has organized the field day for five years and the success of the event is clearly evident.

"We have the perfect setting for outdoor education—the banks of the Ohio River," said Underwood. "Five years' worth of tree plantings are growing strong along this river bank. It's the best of all worlds. The students learn about the importance of trees and other natural resources, our company benefits by improving environmental awareness and our community benefits from having a reforested river bank."

Underwood also credited the Kentucky Division of Forestry (KDF), the Natural Resource Conservation Service, the Ohio River Valley Sanitation Commission and Gallatin Steel staff for their assistance with the event. "A great deal of planning and coordination with other agencies is required to make this event run smoothly, and KDF has been an important partner in assisting with the reforestation project," he noted.

Chris Scott, KDF forest ranger for Gallatin County, has worked with Underwood since the inception of the field day in 2006. Scott's technical assistance in tree selection, spacing and maintenance has gone a long way in making the reforestation project a success.

On the day of the event, Scott provides students with a demonstration of how to plant bare-root seedlings. Each student then plants their own seedling, overlays a vegetation mat to suppress weed growth and attaches a tree shelter to protect the tree from animal browse and herbicide damage.

Students also participate in other activities ranging from forestry, geology, soil sampling, and water quality to physics, electricity, safety and a fitness challenge course.

With environmental field days and outdoor classrooms becoming ever-popular, students in Carroll and Gallatin counties are fortunate to have an opportunity such as Gallatin Steel's field day. The company not only demonstrates their commitment to the environment and to safety, they provide students with a broader understanding of science and the world around them.

KDF Forest Ranger Chris Scott hands a tree seedling, vegetation mat and tree shelter to a Carroll County student during the event.
Photo by Lynn True

Unsightly tires becoming a thing of the past

Continued from Page 3

will have to rig a pulley system to extract them. However, the Fores think they will be able to take small loads to other area amnesties.

"We inherited a tire problem that was no fault of our own that would have cost us a fortune in money and years in time to remedy," said Bob. "The division comes in and takes care of the problem within a few days. The importance of this program is just a gift we can't explain."

The Waste Tire Amnesty Program is supported by the Waste Tire Trust Fund established by the Kentucky General Assembly in 1998. Legislation requires tire retailers to collect a $1 fee on all new replacement motor vehicle tires sold. Retailers may retain five cents to offset administrative costs, but the balance goes into the Waste Tire Trust Fund, which is dedicated to managing scrap tires and developing sustainable markets for recycled tire products.

Illegal tire dumping is 'bad behavior'

Continued from Page 3

tires by hand and pulley system and transporting them to the staging area at the landfill. An excavator was also used for the last batch of deeply-buried tires.

Mac's Tire Recycling (MTR), the state's contractor for waste tire removal, hauled away 10 tractor-trailer loads from Lee County that weekend.

"The money provided to our county by the Waste Tire Fund and the pickup effort by MTR has really been a time and financial blessing," said Watterson-Jackson.

Observing Earth Day

By Allison Fleck
Division of Water

The Environmental Quality Commission bestowed its annual Earth Day awards to 10 individuals and groups who have made significant contributions to the environment. Guest speaker Gwendolyn Keyes Fleming, Region 4 administrator of the U.S. Environmental Protection Agency, praised the awardees during the April ceremony in Frankfort.

"We are responsible for building the type of environment future generations can thrive in," Fleming said. "These awardees represent that goal. One person's practices can have a huge impact going forward. We must invest now and be proactive."

Len Peters, secretary of the Energy and Environment Cabinet, echoed her comments. "Today, we are honoring a diverse group with a common goal—to clean up and take care of Kentucky's environment," he said. "I'm delighted to see two students on this list, and I'm equally excited to recognize one individual who has spent his 79 years making Kentucky a better place."

Dr. Lee Dew received the Lifetime Achievement Award for his involvement in the environmental preservation movement since 1969, "back when people thought you were a weirdo and subversive," Dew said with a smile. "I was a terrible embarrassment to the administration at Kentucky Wesleyan, where as a professor I rode my bicycle around campus picking up aluminum cans," he reminisced. "Of course, now they have recycling containers all over the campus."

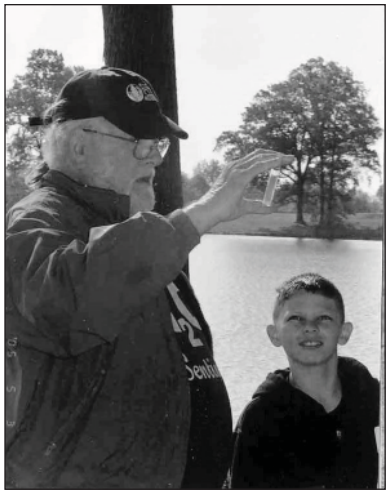
Dew believes he has a moral obligation to make the world a better place. He said he has "planted too many trees to count" and that "taking care of nature is the ultimate expression of faith."

"As a former teacher, I think the teacher and the environmentalist share a sense of optimism," Dew said. "We both have to believe that what we are doing will make a difference."

Dew has lived his belief by helping spur recycling in Owensboro, organizing the Tradewater/Lower Green Watershed Watch program and serving as a "water sentinel" for the Sierra Club. He also makes presentations at environmental events across the state. Dew believes the biggest enemy of the environment is not industry or pollution, but rather public apathy.

"We have to get beyond ourselves and think of generations to come," he said. "People are here for just a few decades while our planet is here forever."

Dew gains hope from young people like Candace Wells, age 18, who was the youngest recipient of a 2011 Earth Day award. As president of her senior class at Eminence Independent High School, Wells approached the city council about establishing regular trash cleanup days as a class service project. She even convinced the council to make monetary donations to the class for their time.



Dr. Lee Dew has spent years working with young people to teach the importance of protecting water quality.
Photo submitted

"It was good for the city and created a sense of civic duty among the students," said Wells. "When you get a sense of ownership of an area, it gets you more committed and involved. We are encouraging next year's class to sustain the project, and the next after that."

This year's Public Service Award was presented to J.R. Williamson of Scott County for his commitment to protecting natural resources, his extensive educational outreach and his encouragement to other communities to recycle and reuse. In 1993, Williamson founded the Solid Waste Coordinators of Kentucky, an organization that encourages counties to work together to solve solid waste issues. He served as chair from 1993 to 1996.

Other award recipients include:

- Bracken County Conservation District
- Jessamine County Judge-Executive William Neal Cassity
- Green Castle Baptist Church
- Bridgeport Christian Church
- Randall Napier
- Marvin Lee Bryant Jr.
- Woodford County Conservation District

'Save Kentucky's Hemlocks' project receives grant

By Lynn True
Division of Forestry

The Kentucky Division of Forestry (KDF) recently received a $15,000 grant from Toyota Motor Manufacturing of Kentucky during a presentation of nearly $90,000 given to five environmental programs across the Commonwealth. The funding will help KDF educate private landowners about the devastation caused by the hemlock woolly adelgid (HWA), an aphid-like insect that threatens the health of eastern hemlock trees.

Specifically, KDF will work through the 'Save Kentucky's Hemlocks' project and partner with the University of Kentucky's Cooperative Extension Service to produce a guide for landowners on how to treat hemlock trees from infestations of HWA.

"This grant will assist the division in controlling and managing one of the biggest insect threats to Kentucky's forests," said KDF Director Leah W. MacSwords. "Kentucky's forests contain more than 76 million eastern hemlock trees, and the potential for

Continued on next page

The essence of significant operational compliance

By Leslie Harp
Division of Waste Management

Humorist Will Rogers is famous for saying, "When you find yourself in a hole, stop digging." That holds true for many when the realization hits that programs aren't working the way they should. That is exactly what the Underground Storage Tank (UST) Branch in the Department for Environmental Protection did when employees found that the significant operational compliance (SOC) rates were not what they should be.

SOC is essentially a snapshot in time to help determine whether a UST facility is in compliance at the time of inspection. In 2003, SOC became the measure employed by the U.S. Environmental Protection Agency (EPA) as a general assessment of UST facility significant operational compliance. At that time, Kentucky's SOC rates hovered around 40 percent.

With that in mind, the Compliance Section in the UST Branch was given the task of finding ways to improve the SOC rates. By implementing some radical, short-term changes such as having field inspectors assist in identifying data reporting issues, the branch was able to find outdated or incorrect data for UST-facility equipment. Using the field inspectors as added eyes and ears, the branch took three months to clean up the data to ensure an accurate base from which to move forward.

Once the database was more accurate, enhanced inspector training to improve consistency in inspections was identified as the next measure to address. Even new inspectors, through updated standard operating procedures, could hit the ground running and perform inspections consistently and on par with the more experienced inspectors. That has led to the use of more consistent criteria for issuing violations and allowed for effective reporting that better identifies problem areas within the SOC criteria.

However, none of this would work unless owners and operators were given the help they needed in understanding the vast array of technical compliance requirements, dates that reports were due and even what the site-specific requirements were that must be met in order to be in compliance. By addressing this issue, the owners and operators would know what was expected and could be more prepared for the next site inspection.

Not only were the compliance needs of owners and operators addressed, but inspectors were given new standards of practice that put the emphasis on the technical inspection aspects of their role rather than chasing paper violations that did little to aid in making a difference with UST compliance. This gave field inspectors greater ability to evaluate system components.

What it all boiled down to was doing a better job communicating with owners and operators. Establishing a clear, focused and efficient communications process has been critical in making sure owners and operators are aware of when testing is due, among other things. This outreach effort helps owners remain in compliance and decreases the amount of time inspectors are required to spend at each site. Annual reminder letters are sent along with requests for updated information from the UST owners and operators. A new email address dedicated to receiving reports has been established to ease the burden of reporting and increase communication between the compliance section and contractors submitting the reports.

The Kentucky UST Branch is also beginning its third year of publishing the UST Quarterly newsletter that offers timely information to the regulated community on a variety of information, including technical compliance. This, in conjunction with enhanced information on the branch Web page, offers owners and operators additional assistance with maintaining compliance.

The results of implementing these components have been significant. SOC rates have increased 20 percent in some areas and 13 percent overall. A number of owners and operators have expressed their pleasure with the new process.

"The Compliance Section of the UST Branch and the Field Operations Branch have done an outstanding job designing and implementing the new compliance assistance and database cleanup procedures," said Rob Daniell, manager of the UST Branch. "Leak prevention is a primary goal of the compliance and inspection programs and these efforts represent great strides in achieving that goal."

As they say, it's a "win-win" for everyone.

'Save Kentucky's Hemlocks' project receives grant

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HWA to destroy hemlock populations would have a profound impact on forest ecosystems. Fortunately, this grant will assist us in detecting, eradicating and preventing the spread of this insect and subsequent decline of hemlocks."

Since 2006, HWA infestations have been found in 19 Kentucky counties. The insect, which feeds on the hemlock's needles and reproduces exponentially, has the potential to spread rapidly and kill the tree if it is not treated in a timely manner. Many experts believe that the adverse effects from HWA could be as severe as the chestnut blight, and that we may lose our hemlocks just as we lost the American chestnut tree.

Treatment options for HWA infestations include systemic insecticides containing imidicloprad through soil drenching, soil injection and/or trunk injection. These treatments may remain effective for two to five years. Trees may also be sprayed with insecticidal soaps and horticultural oils during March through April and from September to October. This type of treatment may be needed during both the spring and fall or at least annually.

For more information about protecting our native hemlocks, visit Save Kentucky's Hemlocks website at www.kyhemlocks.org. Citizens should notify forestry officials of infestations by calling 502-564-4496.

Coley receives award for wildlife photo

Raven Coley

Raven Coley, a seasonal employee with the Kentucky Division of Forestry (KDF), received an award in the Intermediate Division at the Spring Photography Weekend held at Pennyrile Forest State Resort Park. Coley's photo of a Whitelip snail (*Neohelix albolabris*) was selected among others in the insect and mollusk category.

"Photography has always been an interest of mine, but it has become more of a serious hobby in the last year," said Coley. She shoots with a Canon T2i and prefers wildlife photography.

Coley works in the Frankfort office as an administrative specialist during forest fire seasons and hopes to continue her career with KDF. She lives in Frankfort with her husband, Jacob, two-year-old daughter, Brooklynn and 10-month-old son, Bennett.

Smallwood is winner of Earth Day photo contest

Zackery Steven Smallwood of Menifee Elementary K-8 School "captured the earth" with his winning photograph of Broke Leg Falls located on the eastern edge of the Daniel Boone National Forest.

The photography contest, sponsored by the Energy and Environment Cabinet, asked Kentucky middle-school students to submit an original photo along with a paragraph explaining why the photo represents Kentucky's 2011 Earth Day theme *"Playground Earth: Get Outside, Kentucky!"*

Smallwood's photograph shows his father and younger sister as they explore the falls.

The Kentucky Department of Parks provided Smallwood and his family two nights lodging at a Kentucky State Resort Park of his choice for winning the contest.

Smallwood wrote: ***"This photo shows that sense of discovery you get, taking in everything around you, from high water falls to hugh rock walls. Most children are so immersed in a world of video games that they do not know that such beautiful places as this exist, even when it is practically in their own backyard! If they do not just get out in nature, in the near future, these amazing places may be all but forgotten."***

Capitol Education Center promotes environmental stewardship

By Roberta Burnes
Division for Air Quality

Capitol campus visitors to the 2011 Governor's Derby Celebration got a sneak peek at the new Capitol Education Center, located between the Governor's Mansion and the Annex parking structure. The facility, scheduled to open within the coming year, will educate visitors and utilize multiple renewable energy sources to promote Kentucky's progressive energy conservation initiatives. The recently renovated building formerly served as the old chiller plant for the Capitol campus and has been recycled for this new purpose.

"With approximately 60,000 people, most of whom are students, visiting the Capitol campus every year, we are pleased to be opening a Capitol Education Center," said First Lady Jane Beshear. "This center will provide the opportunity to educate thousands of children on the importance of environmental stewardship for Kentucky's future."

Exhibits on Derby Day featured information from the Division for Air Quality, ENERGY STAR, the U.S. Green Buildings Council, the Kentucky Green and Healthy Schools Program, University of Kentucky student projects and net-zero energy schools in Kentucky. Net-zero energy buildings produce as much energy as they consume throughout the year. These buildings make use of design strategies and technologies that greatly reduce energy demand, thereby enabling the use of on-site sources of energy such as solar panels to produce all required energy.

In addition, visitors to the center were treated to interactive exhibits on loan from Blackacre Nature Preserve/Jefferson County Public Schools and the Division for Air Quality. Blackacre's energy bikes allowed visitors to use pedal power to demonstrate how much physical energy it takes to power a lightbulb. The Division for Air Quality's tire display demonstrated the importance of keeping tires properly inflated. Under-inflated tires use more energy, wasting fuel and money. Visitors received their own tire gauge and learned how to use it to check their tire pressure.

The Capitol Education Center will provide space to hold lectures and educate visitors about sustainability, geography, tourism and government. The building itself will be a teaching tool, demonstrating "green" building practices and rooftop electricity generation utilizing solar panels and a wind turbine, which will be used to help power the Governor's Mansion. Other green building practices include solar hot water panels, a green roof to reduce stormwater runoff and insulate the building, recycled denim insulation in the walls, recycled-content floor tiles, Light Emitting Diode (LED) light fixtures, a gray water system, dual flush toilets and low-VOC paint.

ABOVE: Which lightbulb is the most energy efficient? Nine-year-old Madeline Gardner of Crestwood uses pedal power to compare the difference between LED, compact florescent and incandescent lightbulbs.

LEFT: Emily Leamon, age 12, and Laiken Mattocks, age 11, try out the tire inflation display, which allows visitors to compare the energy needed to rotate a properly-inflated tire with one that is under-inflated. Photos by Sam Ruth

Awards

Gray recognized as Outstanding Service Forester

By Lynn True
Division of Forestry

Forester Steve Gray, with this wife Margaret, following the award ceremony at the Kentucky Woodland Owners Association meeting. KDF photo

Kentucky Division of Forestry (KDF) employee Steve Gray received the Outstanding Service Forester Award from the Kentucky Woodland Owners Association (KWOA) during the annual meeting held at Carter Caves State Resort Park. Gray has helped advance forest management through his work with private landowners for 30 years. He was selected by KWOA to receive the award based on his accomplishments in forestry management and long-time association with private landowners.

As district forester for KDF's Central District, Gray oversees all district functions and staff, provides technical assistance to woodland owners, prepares forest stewardship plans and inspects American Tree Farms for certification. His responsibilities also include wildland fire suppression, conducting forestry education programs and assisting with timber harvest inspections.

"Steve is highly respected and appreciated by landowners throughout the Central District," said Hart County tree farmer Dr. James Middleton. "I have worked with Steve for more than 20 years, and I have always found him to be professional and knowledgeable. The Central District is fortunate to have someone of his caliber."

Gray's district serves Allen, Barren, Breckinridge, Bullitt, Edmonson, Grayson, Hancock, Hardin, Hart, Jefferson, Larue, Meade, Nelson, Simpson, Spencer and Warren counties. Despite a demanding workload, he also makes time to work cooperatively with other resource agencies including the conservation districts, county extension, Department of Fish and Wildlife Resources, Natural Resource Conservation Services and Farm Services Agency.

"The Division of Forestry is fortunate to have the dedication, experience and leadership of employees like Gray who provide an invaluable service to landowners and who play an important role in protecting the health of our forest lands," said KDF Director Leah W. MacSwords.

Clean Air Kid's Camp

Continued from Page 7

multiple facets of air quality in a day camp experience, students came away with a more complete picture of how their parents' work fit in with the Division for Air Quality. The day camp had the added bonus of increasing staff awareness and appreciation for the importance of environmental education.

"The ultimate goal of environmental education is to give students the tools to think critically about the world around them," said Burnes. "Kids who understand the relationship between their personal actions and air quality will be more capable of making informed decisions about their world in the future."

The Division for Air Quality employs a full-time environmental educator to develop educational programs, curricula and coordinate air quality outreach programs for the public. Field staff also assist with outreach activities. For information about environmental education activities, contact Roberta.Burnes@ky.gov.

Franklin County school receives Biofuels for Schools grant

Continued from Page 4

"We are looking towards the future and how we can aid in fuel cost reduction, making agriculture stronger, lowering the carbon footprint, saving our environment for the next generation and helping everyone improve their quality of life," says Wheatley.

For more information on the Kentucky Biofuels for Schools program visit www.bio-schools.org or email kenya@bio-schools.org. A complete list of the 2010 *TogetherGreen* Fellows can be found at www.TogetherGreen.org/fellows.

Arbor Day Foundation honors Kentuckians

By Lynn True
Division of Forestry

The Arbor Day Foundation, the nation's largest nonprofit organization dedicated to planting trees, recently honored three organizations and individuals from Kentucky for advancing sustainable forestry on public and private lands. The recipients include the Appalachian Regional Reforestation Initiative (ARRI), Hart County landowner Charles D. Williams and Prospect Mayor Todd Eberle.

"When we honor tree planters for the work they do today, we are commemorating the benefits they are leaving for future generations," said John Rosenow, chief executive and founder of the Arbor Day Foundation (pictured left in each photo). "This group of Arbor Day award winners is leaving a lasting legacy through the simple act of planting trees and caring for the Earth."

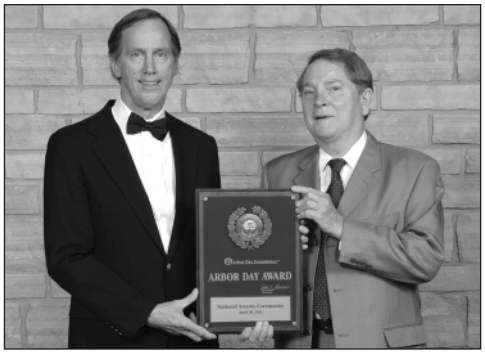
The Arbor Day Foundation has given awards to honor America's foremost tree planters and conservationists since 1972. More information on the foundation and its programs can be found at http://www.arborday.org/

ARRI Partnership

ARRI, formed in 2004 to restore the beauty of the Appalachian Mountains, received the "Forest Lands Leadership Award" for advancing sustainable forestry on public forest land. ARRI's partnership includes citizens, the coal industry and government who are dedicated to restoring forests on coal mined lands in the eastern United States. ARRI has reforested approximately 45,000 acres with more than 30 million trees since 2007. Paul Rothman of the Department for Natural Resources (DNR) and state forester Leah MacSwords accepted the award on behalf of the partnership.

"I am extremely proud of Paul and Leah in their efforts to bring back Kentucky's forests," said DNR Commissioner Carl Campbell. "The reforestation of Kentucky surface mining operations is of primary importance and a long-term goal of DNR. Their involvement has made DNR a leader in the reforestation of previously mined lands since 1996."

"This is a tremendous honor for the Appalachian Regional Reforestation Initiative, and I commend them for their dedication to restoring trees to the mountains," said First Lady Jane Beshear. "Preserving forests is vital to our ecosystem and will sustain the beauty that is characteristic of the region."



Charlie Williams

Landowner Charlie Williams was recognized with a "Good Steward Award" for practicing sustainable forestry on his 929-acre woodland in Hart County. Williams is known around Munfordville as "the tree man," a nickname he earned by planting thousands of trees since he was 15. As a young man, Williams and a neighbor sold redbud and dogwood trees all over town. Today, residents are treated to a spectacular show of blossoms each year in April thanks to his handiwork. William's accomplishments include planting trees on his farm every Good Friday since 1976, being nominated for the National Tree Farmer of the Year in 2010 and winning several state and regional awards. He also started the community's Arbor Day program, while serving as Munfordville's city attorney from 1993 to 2004.

Todd Eberle

Prospect Mayor Todd Eberle received the "Champion of Trees" award for his efforts to promote forestry in his community. Since his election in 2007, Eberle initiated a systematic approach to the city's forestry program. He worked with the city council to develop tree-care ordinances, established the Prospect Forestation Board, required the city to maintain all public trees, and equipped his team with the latest arboricultural and urban forestry tools and techniques. By 2008, Prospect earned Tree City USA recognition for the first time and has since received two Tree City USA Growth Awards for exceeding the program's standards. Prospect was also one of the first communities in Kentucky to implement a response plan to the invasive Emerald Ash Borer by using the latest computer software and recruiting an army of volunteers to assess the diversity of the city's trees.

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Seedling nurseries: growing trees for healthy and productive forests

The yellow-poplar or tulip-poplar is the tallest hardwood tree in North America and has one of the most perfect and straight trunks in the forest. Yellow-poplar can grow to more than 150 feet in virgin cove forests of the Appalachian Mountains, and its rapid growth rate makes it a very valuable timber tree.

May marks the start of the flowering period in Kentucky. The flowers are pale green or yellow with an orange band on the tepals. The unique leaf shape has four lobes separated by rounded notches. Both the tulip-like flower and the leaf shape of this tree support the alternate name of tulip-poplar.

Yellow-poplar seedlings, as well as other native species to Kentucky, are available from early fall to late winter from the Division of Forestry's nurseries. Orders are shipped at your request from late winter through early spring for planting projects during the dormant period. To obtain an order form, visit KDF's website at http://forestry.ky.gov/statenurseriesandtreeseedlings/Pages/default.aspx or call the division at 1-800-866-0555.

Just the Facts: Yellow-poplar (Liriodendron tulipifera)

- **Growth:** Yellow-poplar is fast growing and may reach 300 years of age on deep, rich, well-drained soils of forest coves and lower mountain slopes. On the best sites, old-growth trees may reach 200 feet high and 8 feet to 12 feet in diameter, but more often they are from 100 feet to 150 feet at maturity, with a straight trunk 2 feet to 5 feet in diameter. They typically live about 200 to 250 years; however, some trees may live up to 300 years.
- **Sites:** Yellow-poplar prefers a temperate climate, sun or part shade, and deep, fertile, well-drained and slightly acidic soil.
- **Range:** Yellow-poplar is native to eastern North America from southern Ontario and Illinois eastward across southern New England and south to central Florida and Louisiana.
- **Human Uses:** The wood of yellow-poplar is fine grained, stable and commonly used for cabinet and furniture framing. The soft, light wood and large trunk size made it a preference among Native Americans and early American settlers to use as canoes. Yellow-poplar is also valued as a honey tree, a source of wildlife food and a shade tree for large areas.
- **Wildlife Uses:** Yellow-poplar has nominal value as a source of wildlife food in comparison to some other species, but its seeds are eaten by quail, purple finches, rabbits, gray squirrels and white-footed mice.
- **Tree Trivia:** Yellow-poplar is the state tree of Indiana, Kentucky and Tennessee.