

Winter 2010

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Watershed Stewardship Program

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Watershed Stewardship Fair

January 28, 2010

It's almost time for our annual Watershed Stewardship Fair! With the addition of new programs such as Bacteria Monitoring, we're hoping this year's fair will be the most successful yet.

Cobb's Fair is a data sharing event that showcases volunteer stream projects. Participants are encouraged to share their stream observations and project goals with the community. Each group is invited to create a poster displaying their water quality conservation efforts.

Also, for those who wish, we give each watershed stewardship group a few minutes to relate success stories and share concerns and frustrations with a like-minded audience. This is your opportunity to learn from and support other Cobb County volunteers. So that our volunteers have an opportunity to voice their concerns with state and federal regulators as well as advocacy groups, representatives from Georgia Adopt-A-Stream, Department of Natural Resources Environmental Protection Division, Coosa River Basin

Initiative, and Georgia Conservancy will be present to answer any questions you might have about their water related initiatives.



In addition to a fun evening of education and mingling, tours will be conducted for those who are interested in the day to day workings of the Cobb County Water Quality Laboratory. Join our chemists and biologists as they explain how the lab tests water from Cobb's four wastewater treatment plants to ensure that it is safe to release back into our environment. The tour is great for all ages. In the past, families as well as elementary through high school students participated.

Join us on January 28, 2010 to visit the lab, meet fellow volunteers, and speak to environmental professionals. Drinks and refreshments will be provided. We hope to see you there!

If you would like to attend the Watershed Stewardship Fair, please contact us at 770-528-1482 or water_rsvp@cobbcounty.org.

10 Surprisingly Easy Sources of Alternative Energy

Original article and photos were reproduced from www.mnn.com. Text by Bryan Nelson.

Sure, you've heard of wind and solar power, biofuels, hydroelectric, tidal and wave power, but Mother Nature provides an endless bounty of alternative energy sources beyond those that we use today. Clean, green energy is all around us in the natural world, and scientists have only begun to answer the question of how to tap it. Here's a list of 10 practical sources of alternative energy you've probably never heard of.

Saltwater Power

It has been called saltwater power, osmotic power or blue energy, and it is one of the most promising new sources of renewable power not yet fully tapped. Just as it takes huge amounts of energy to desalinate water, energy is generated when the reverse happens and saltwater is added to freshwater. Through a process called reverse electrodialysis, blue energy powerplants could capture this energy as it is released naturally in estuaries around the world.



Hot Rock Power

Hot rock power is a new type of geothermal power that works by pumping cold saltwater down to rock which has been heated by conduction from the Earth's mantle and by the decay of radioactive elements in the crust. As that water heats up, the energy created can be converted into electricity by a steam turbine. The advantages of hot rock power are that the output can be easily controlled and it can provide energy 24/7.

Piezoelectricity

As the world's human population approaches a whopping 7 billion, tapping into the kinetic energy of human movement could become a source of real power. Piezoelectricity is the ability of some materials to generate an electric field in response to applied mechanical stress. By placing tiles made of piezoelectric material along busy walking paths or even in the soles of our shoes, electricity could be generated with every step we take making people into walking power plants.



Human Sewage

Poo power? Even human sewage can be used to create electricity or fuel. Plans are already underway to power public buses in Oslo, Norway with human sewage. Electricity can also be generated from sewage using microbial fuel cells, which utilize a bio-electrochemical system that drives a current by mimicking bacterial interactions found in nature. Of course, sewage can also be put to use as a fertilizer. The poo-sibilities are endless!



Ocean Thermal Energy Conversion (OTEC)

Ocean thermal energy conversion, or OTEC for short, is a hydro energy conversion system that uses the temperature difference between deep and shallow waters to power a heat engine. This energy could be tapped by building platforms or barges out at sea, taking advantage of thermal layers found between the ocean depths.



Evaporative Energy

Inspired by plants, scientists have invented a synthetic, micro-fabricated “leaf” that can scavenge electrical power from evaporating water. Air bubbles can be pumped into the “leaves”, generating electricity by the difference in electrical properties between water and

air. This research could open the door to more grandiose ways to trap the power created from evaporation.

Space-based Solar Power

Since the Sun’s energy is unaffected in space by the 24-hour cycle of night and day, weather, seasons, or the filtering effect of Earth’s atmospheric gases, proposals are underway to put solar panels in orbit and beam the energy down for use on Earth. The technological breakthrough here involves wireless power transmission, which could be performed using microwave beams.

Vortex-induced Vibrations

This form of renewable energy, which draws power from slow water currents, was inspired by the movement of fish. The energy can be captured as water flows past a network of rods. Eddies, or swirls, form in an alternating pattern, pushing and pulling an object up or down or side to side to create mechanical energy. It works in the same way that fish curve their bodies to glide between the vortices shed by the bodies of the fish in front of them, essentially riding in each other’s wake.

Helioculture

This revolutionary process called helioculture was pioneered by Joule Biotechnologies and generates hydrocarbon-based fuel by combining

brackish water, nutrients, photosynthetic organisms, carbon dioxide and sunlight. Unlike oils made from algae, helioculture produces fuel directly in the form of ethanol or hydrocarbons that does not need to be refined. The method essentially utilizes the natural process of photosynthesis to produce a ready-to-use fuel.



connections

Traditional power plants use superheated water to create steam to power turbines for electricity generation. Water is also used to cool the steam for recycled use. When this water is returned to nearby rivers and lakes, the temperature may be ten to twenty degrees higher than at intake, affecting the water quality. Many alternative energy sources are not only cleaner than traditional coal-powered plants, but they may also help protect the quality and quantity of our waterways.

Mining the Moon

Helium-3 is a light, nonradioactive isotope that has immense potential to generate relatively clean energy through nuclear fusion. The only catch: it is rare on Earth but abundant on the Moon. Many projects are underway to mine the Moon for this resource. For instance, the Russian space company RKK Energiya announced that it considers lunar helium-3 a potential economic resource to be mined by 2020.



“Clean, green energy is all around us in the natural world, and scientists have only begun to answer the question of how to tap it.”

SQUIRRELS

they won't drive you nuts

Suburban and urban areas are home to many animal species that can rapidly adapt to changing environments. These species are called generalists and include squirrels, raccoons, opossums, pigeons and sparrows. Humans are widespread generalists too.

Squirrels established in our neighborhoods can profit from human habitat because it provides two essential needs: shelter and food. Occasionally the little critters will move into our attics, ravage bird feeders and munch on your garden as if it was a salad bar. They are opportunistic and will take the path of least resistance, just like the rest of us! We make their lives easier and they take advantage of it. By better understanding the animal, we might facilitate an easier cohabitation.

A squirrel proof birdfeeder? Only if you seal it properly.



Native Americans and early European settlers appreciated the value of squirrels in the kitchen. Nowadays the meat is considered a culinary delicacy, and many recipes for Brunswick stew name it as a main ingredient. The soft fur of some species is used to make paintbrushes. Historically, Cinderella wore squirrel fur shoes instead of glass. During translation from French, Charles Perrault's use of the word *vair* (squirrel fur) was mistaken for *verre* (glass). Although there is no reliable account of the mishap, it would explain how the character ended up in such uncomfortable footwear.

There are several species of tree squirrels that can be found in a variety of habitats around the world, with the exception of Oceania. They are mammals in the rodent family, like chipmunks and hamsters.

The four front teeth of rodents never stop growing, a mechanism that prevents the teeth from wearing down as they munch on hard materials like nutshells. Two species are native to Georgia, the most common being the Eastern gray squirrel (*Sciurus carolinensis*). Fox squirrels (*S. niger*) can also be found statewide. Red squirrels (*Tamiasciurus hudsonicus*), although not native to Georgia, have been spotted as far south as the higher elevations of the Blue Ridge Mountains. Flying squirrels (*Glaucomys volans*), though not considered a tree squirrel, also makes its home in the forests of our state. All are members of family *Sciuridae*, whose name comes from two distinct ancient Greek words: *skia* (shadow) and *oura* (tail). Literally, the squirrel is an animal that sits in the shadow of its tail. This grand feature plays many vital roles: It keeps the body warm in winter, helps with balance, and is a communication tool. A twitch of the tail may be an aggressive response to scare an offender away.

Squirrels can reproduce twice a year: late winter and late summer if resources allow. Gestation lasts around 40 days. The litters usually number two or four pups weighing $\frac{1}{2}$ ounce. Blind, naked and deaf, they are easy targets for predators. At eight weeks the youngsters venture out of the nest. In less than three months, they leave their mother and siblings to live independently.

Males will chase each other to establish dominance, but they are not known for physical fights. Combat is rare and may result in serious injuries. In their natural habitat, they

Photography Spotlight



Red Cedar (*Juniperus virginiana*) berries provide gardens with winter interest and a valuable wildlife food source.

Submitted by Catherine Mercier-Baggett

Have a great photo to share?
Send it to water_rsvp@cobbcounty.org.

Did You Know?

establish a home range of three acres, while in urban environments up to ten individuals can share one acre.

Squirrels are preyed upon by snakes, hawks, foxes, weasels and bobcats. In areas populated by humans, cats and dogs can be a serious threat. Diseases and parasites such as ticks, fleas and lice are considerable causes of mortality, but rarely do squirrels transmit diseases to humans. Scarce resources and inclement weather drastically affect survival and reproduction. The gray squirrel can live up to ten years, but most will not make it through a first year before facing death.

They are active mainly during the day. In the summer heat they are more likely to come out early in the morning or late afternoon. They allocate a lot of time to find and bury food and are omnivores, consuming nuts, berries, mushrooms and flowers, insects, eggs and small vertebrates. Squirrels are very fond of a variety of seed mixtures designed for birds, and they are well equipped to reach into the feeders. Their mobile hind feet can turn 180 degrees, which helps them climb and jump, and their agile forepaws can manipulate small items easily. There are many solutions to help curtail the ravaging. Some bird feeders have mechanical features such as spinning or inverted metal cones, but squirrels are resourceful creatures that can outsmart our efforts! The use of hot pepper coated seeds is one of the most efficient strategies. While birds are not affected by the capsaicin, the small mammals are sensitive and will quickly learn to stay away. It has been reported that a squirrel feeder installed at least 50 feet away from the bird feeder might distract the squirrels, as long as it is constantly replenished with corn cobs and other rodent delicacies.

Contrary to popular belief, the little critters do not 'forget' the location of their caches; in fact they have a keen sense of smell to guide them. They leave part of their stash behind because they collect more than they consume (although they can gobble up to 2 pounds of food each week), and the leftovers will germinate later on. Squirrels are important agents of dispersion for plants, especially among hardwoods, turning the soil and planting seeds.

Tree squirrels build a nest - called drey - with fallen leaves, twigs and shredded material that is well camouflaged in the canopy. However, they prefer to adopt

Flying squirrels have a membrane attached to their ankles and wrists that works like a cape and allows the animal to control its fall when leaping from trees. Using their tail as a rudder, flying squirrels can travel up to 150 feet using this method.

an existing cavity in a trunk when they are available. This is why attics are so appealing to them. The upper stories of our homes are attractive hollow nests, especially if they are insulated with loose material such as cotton. High frequency sound repellers (available for less than \$20), predator scents (such as coyote urine) and bright lights are great options to keep squirrels out. If you must evict unwanted visitors, use the service of a professional that offers humane methods. Shooting or poisoning is illegal and cruel; refer to www.humanesociety.org for additional peace negotiation strategies.

Squirrels are ambassadors of wildlife among our cities and should be respected like any other creature. Take the time to learn about them, observe their unique behavior and appreciate their acrobatics. You'll find that they can be quite entertaining!



Resources

Squirrels, The Humane Society of the United States, www.humanesociety.org/animals/squirrels/

Squirrel Fact Sheet, Georgia DNR Wildlife Resources Division, www.georgiawildlife.org

Mammal Fact Sheets: Eastern Grey Squirrel, Hinterland Who's Who, www.hww.ca

Eastern Gray Squirrel, Smithsonian National Museum of Natural History, North American Mammals, www.mnh.si.edu/mna

Squirrel, National Geographic, <http://animals.nationalgeographic.com>

Koprowski, John L., 1994 *Sciurus carolinensis*. Mammalian Species, no. 480, pp.1-9

welcome

new watershed stewards

Simon Locke

will be monitoring Butler Creek

Michel Belland

will be monitoring Willeo Creek

Andrea Searles

will be monitoring Sope Creek

John and Vicki Hammond

will be monitoring Noses Creek

Charles Stubbs

will be monitoring Noonday Creek

Brian Duke

will be monitoring Sewell Mill Creek

The KSU Geography Club

will be monitoring Proctor Creek,
Butler Creek, and Lake Acworth

Lyndsey Lieb

will be monitoring Noonday Creek

student submissions

Clean Water I think about
all Summer long.
Dirty Water I think
will always be wrong.

If it's clean we can play.
If it's dirty we stay away.
Which would you have on a hot
summer day?

I'll do my part
to keep the water clean.
What will you do?
The future is up to you.

Jasmin Askew, 2006
Acworth Elementary School

K-12 students can submit art or poetry to
water_rsvp@cobbcounty.org

Visit us online at www.cobbstreams.org

Rain Barrel Workshops

Though the drought is over, we shouldn't forget the importance of conserving potable water. During the summer, 40% of household water is used for watering lawns and outdoor plants. Rain barrels are a simple, economical alternative that will not only save water, but save you money as well. Rain barrels also prevent erosion and non-point source pollution by slowing down storm water runoff.

Cobb County Watershed Stewardship will be hosting a series of Make-Your-Own Rain Barrel workshops throughout the year. These workshops will be limited to 15 participants each. All materials and supplies are provided - just show up with a 4-door sedan or larger vehicle and a willingness to get your hands dirty! Now's the time to get your rain barrel before the growing season begins. Workshops are limited to fifteen Cobb County residents each. To register, visit our event calendar at www.cobbstreams.org. Please limit one barrel per household.

All workshops will be held at the Cobb County Water Quality Laboratory, 662 South Cobb Drive, Marietta, Georgia 30060.

WORKSHOP DATE & TIME:
Friday, March 5 • 2pm-3pm

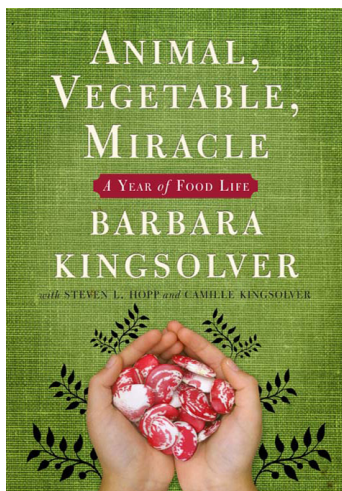
(Keep checking our calendar as we add new dates!)



RECOMMENDED RESOURCE

Animal, Vegetable, Miracle is a wonderfully neighborly account of stunt eating. Author Barbara Kingsolver's family decided to leave their arid life in Tucson and move to Virginia, where they already owned a farm in an Appalachian hollow. They would work the farm and live on

local or home-grown food for a full calendar year.



This meant no snack foods, no processed ones, no cucumbers from warmer parts of the world. Ms. Kingsolver writes about the family's adjustment to these strictures. When a watermelon the size of a toddler has traveled around the world to a supermarket, Ms. Kingsolver suggests rethinking the process of how it got there.

Animal, Vegetable, Miracle expresses the basic tenets of Slow Food International sustainable agriculture and aims to fill a hole in the soul. "We came a long way, baby, into bad eating habits and collaterally impaired family dynamics," Ms. Kingsolver says. "No matter what else we do or believe, food remains at the center of every culture. Ours now runs on empty calories." She adds: "A lot of us are wishing for a way back home, to the place where care-and-feeding isn't zookeeper's duty but something happier and more creative."

From The New York Times

When songbirds leave their hiding spots in the thickets to eat at your backyard feeders, another type of feathered visitor may arrive on the scene: the Sharp-shinned Hawk. About the size of a dove, this small bird of prey is the most common predator at feeders. Its relative, the larger Coopers Hawk, may also visit feeders for a snack. To prevent your songbirds from being gobbled up by stalking accipiters, simply stop filling your feeders for about a week. Although the songbirds will need to rely on natural foods during that time, the hungry hawks won't have such easy pickings and will move on.

Linda May, Environmental Outreach Coordinator
Georgia DNR, Wildlife Resources Division

observations



ECOPEDIA

Gaia - Theory that suggests the Earth's pleasant temperature, breathable air, and nonacidic waters are produced and regulated by the growth and metabolism of life. All life forms are physically connected through air, oceans, fresh water, and other fluids of earth, and respond to each other through differentials in growth, metabolism, and behavior. *From Ecology: A Pocket Guide*



CONSERVATION TIP

This winter, keep your fireplace damper closed unless a fire is going. An open damper can let 8 percent of heat in your home escape. In the summer, cool air escapes. That's about \$100 a year - up the chimney. *From The Green Book*

REMINDERS

- RSVP for the Watershed Stewardship Fair by January 15!
-
- Rivers Alive Clean-Up Volunteers: Submit your data online at www.riversalive.com.
-
- Anuran Monitoring Volunteers: The winter breeders are calling! Be listening for spring peepers, upland chorus frogs, american toads, spadefoot toads, and leopard frogs. Don't forget to submit your reports!



Cobb County
Watershed Stewardship Program
662 South Cobb Drive
Marietta, Georgia 30060



Cobb County...Expect the Best!

This is an official publication of the Cobb County Water System, an agency of the Cobb County Board of Commissioners.

Calendar of Events

January

- 23 Adopt-A-Stream Chemical Monitoring Workshop • 9am-12pm • Water Quality Lab
- 28 Watershed Stewardship Fair • 7pm-9pm • Water Quality Lab

February

- 6 Adopt-A-Stream Biological Monitoring Workshop • 9am-2pm • Water Quality Lab
- 27 Adopt-A-Stream Confluence • Stone Mountain

March

- 5 Rain Barrel Workshop • 2pm-3pm • Water Quality Lab
- 6 Adopt-A-Stream Bacteria Monitoring Workshop • 9am-12pm • Water Quality Lab
- 19-20 Environmental Education Alliance of Georgia Annual Conference • Kennesaw State University
- 25 Household Hazardous Waste Workshop • 6:30pm-8:30pm • Water Quality Lab

April

- 8 Anuran Monitoring Workshop (classroom) • 7pm-8:30pm • Location TBD
- 13 Anuran Monitoring Workshop (field study) • 8pm-9pm • Location TBD

Events in **red** are Cobb County Watershed Stewardship events.
More information can be found on our Calendar at www.cobbstreams.org.