



Project Learning Tree
Project WILD
Project Aquatic WILD
Project WET

New Jersey Department of Environmental Protection
Fall 2007

## Global Climate Change Meets Ecophobia (Excerpt) by David Sobel

*This excerpt is reprinted with permission from Synergy Learning, International, Inc. It first appeared in Connect magazine's Investigating Climate Change issue, November/December 2007.*

Ever since Al Gore's *An Inconvenient Truth* brought global climate change firmly into the public consciousness and public schools, the cards, letters and e-mails keep on coming. "Is it really appropriate for third graders to watch this movie?" worried parents and teachers ask me. Their deep concern: Is it useful, or counterproductively upsetting, for children to be educated about the world going to hell in a handbasket?

People ask me because about ten years ago, I wrote a little book called *Beyond Ecophobia*, advocating for honoring developmental appropriateness in environmental education. At that point, I railed against premature rainforest education for young children. I was concerned about the curriculum message *that the rainforest is being destroyed and it's your responsibility, first graders, to save it!* This would have been like asking us children growing up in the early 1950's to find a cure for polio.

In a "My Turn" essay of the August, 2005 *Newsweek*, Brookfield (Illinois) Zoo educator and parent Katie Johnson Slivovsky framed the dilemma well in pointing out the problem with some eco-ardent children's literature-in this case a book about extinct animals for pre-schoolers. Here's her portrait of reading this book as a bedtime story.

*"L' is for Las Vegas Frog.... People built the city of Las Vegas and paved over all the freshwater springs where this frog used to live. Sadly, we say good-bye to the Las Vegas frog." The very last sentence of the book is, "Let's hope humans never become extinct."*

"Night-night, Jimmy."

### Hurricanes, Oceans, and Icecaps, Oh My!

The same thing is happening right now with global warming education. The ice caps are melting, mosquito populations are expanding and spreading serious diseases, hurricanes are

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getting windier and we need children to understand that it's their responsibility to fix these problems. But no pressure!

Numerous media projects are in the works to address the current problem of global climate change and the solution, education for sustainability. There's a puppet-based television show aimed at four- to six-year-olds, another PBS animated program aimed at eight- to ten-year-olds, and child-sensitive versions of *An Inconvenient Truth*. I've recently been asked to be on three different advisory boards and to write the foreword for a new book on the science of global warming by noted children's book author and illustrator, Lynne Cherry. Yikes! What do I say?

On the one hand I believe that global climate change is caused by human behavior and we've got to do something about it fast. On the other hand, I'm concerned that prematurely recruiting children to solve this overwhelming problem will just make them feel helpless and hopeless, instead of motivating them to walk to school instead of riding in their parents' cars.

I'm reminded of the Godzilla meets Rodan movies of my childhood. Godzilla is Global Climate Change and Rodan is Developmentally Sensitive Environmental Education. They're battling in the Tokyo of my mind and my convictions are getting trampled. So here's my attempt to conduct a bit of conflict resolution between the two.

*Excerpt continued page 2...*

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## The Horns of the Dilemma

Parents and educators are of two very different minds when faced with this dilemma. After being trained as a global climate change educator by Al Gore and National Wildlife Federation educators, Lisa Shimizu, a programmer at the Seattle rock station KEXP, decided to create a child-friendly version of the *An Inconvenient Truth* slide show. She simplified the content, mollified some of the tragedy, kept a reasonable amount of graphs and charts and targeted it for use with eight- to ten-year-olds. After showing it to a large family audience with lots of elementary-aged children, an interesting Web dialogue ensued that framed the divergent points of view on the issue.

One parent, reflecting some of my concerns, said:

*"One concern to at least be aware of is that if we hit kids (before 6th grade) too hard with environmental problems, they learn the facts, understand the issues are important, but don't become more environmentally active. Instead they may be overwhelmed. Younger kids may best be served by following the lead of Rachel Carson, and building a sense of wonder and love for the earth."*

Excerpt continued page 7...

## Flora & Fauna of the Season

Photo by Liz Jackson



*Asclepias syriaca*

**Common Milkweed** - People have used milkweed for fiber, food, and medicine all over the United States and southern Canada. Milkweed supply tough fibers for making cords and ropes, and for weaving a coarse cloth.

The cardiac glycoside in milkweed has also been useful as a chemical defense for monarch butterflies (*Danaus plexippus*). Chemicals from the milkweed plant make the monarch caterpillar's flesh distasteful to most predators. Monarch butterflies are specific to milkweed plants; this is the only type of plant on which the eggs are laid and the larvae will feed and mature into a chrysalis. Eggs are laid on the underside of young, healthy leaves. Accordingly, this is a wonderful horticultural plant for landscaping to attract butterflies (particularly monarchs), whose numbers are declining and migratory routes changing due to lack of appropriate habitat. Fortunately, Common milkweed is easily propagated by both seed and rhizome cuttings.

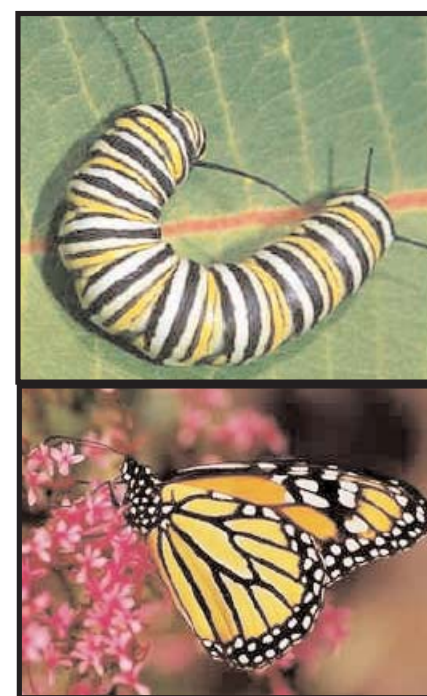
Source: USDA NRCS Plant Database at [www.plants.usda.gov](http://www.plants.usda.gov)

The monarch butterfly is sometimes called the "milkweed butterfly" because its larvae eat the plant. In fact, milkweed is the only thing the larvae eat! Adult female monarchs lay their eggs on the underside of milkweed leaves. These eggs hatch, depending on temperature, in three to twelve days. To attract monarchs to your garden purchase milkweed seeds or transplant root cuttings.

The larvae feed on the leaves for about two weeks -molting 5 times- to develop into bigger caterpillars about 2 inches long. After awhile, the caterpillars attach themselves head down to a twig, shedding their outer skin and begin the transformation into a pupa (or chrysalis), a process which is completed in a matter of hours.

The monarch chrysalis resembles a waxy, jade vase with gold accents and becomes increasingly transparent as the process progresses. The caterpillar completes its miraculous transformation into a beautiful adult butterfly in about two weeks. The butterfly finally emerges from the now transparent chrysalis by inflating its wings with a pool of blood stored in its abdomen. When this is done, the monarch expels any excess fluid and rests.

Eastern populations winter in Florida, along the coast of Texas to Mexico, and return north in spring. It takes a few generations of Monarch butterflies to complete the full migration pattern each year. During migration, huge numbers of butterflies can be seen gathered together.



# WILD About...

## Wildlife and Global Warming



When most people think about global warming, it is usually in the context of abiotic factors: drought associated with warming temperatures, rising sea levels and receding glaciers. However, global warming is one of the gravest threats facing both plants and animals today. Wildlife around the world is in danger since the environment is changing faster than it can keep up.

In New Jersey, the US Environmental Protection Agency estimates that average temperatures could rise 4° F by 2100. In fact, there has already been a measurable 2° F increase in NJ's yearly statewide temperatures since 1895.

State climatologists have temperature records dating back to 1895. Their data show significant rise in the average statewide temperature over the last 110 years. In a nutshell, both the cool season (November through March) and the warm season (May through September) are now warmer than in the past, with especially noticeable temperature rise during the cooler season.

Summer temperatures indicate a likelihood of more days above 90° F yearly. Likewise, winter temperature trends imply 14 fewer days each year where the temperature will drop to 32° F or lower than it did 100 years ago.

Impacts to New Jersey's wildlife include: increased populations of year-round Canada geese; the spread of noxious native plants like poison ivy and invasive plant species like garlic mustard, purple loosestrife and Japanese honeysuckle; caterpillars hatching before the leaves of their food plants are available; and the early departure of our winter birds like the dark-eyed junco.

Dark-eyed Junco



Students should be involved in grassroots conservation efforts to reduce greenhouse gas emissions and conserve New Jersey's wildlife today so they are around tomorrow. Here is how:

- Have students participate in schoolyard habitat creation or enhancement projects
- Encourage them to use compact fluorescent light bulbs at home
- Organize a tree planting event in their community
- Remove invasive plants around their homes and replant native varieties with food or shelter value for local wildlife
- Use a canvas bag from home when shopping

Source: [www.nwf.org/gardenersguide/Gardeners\\_Guide.pdf](http://www.nwf.org/gardenersguide/Gardeners_Guide.pdf)  
[www.nwf.org/globalwarming/pdfs/NewJersey.pdf](http://www.nwf.org/globalwarming/pdfs/NewJersey.pdf)  
[www.nj.gov/dep/dsr/trends2005/pdfs/climate-change.pdf](http://www.nj.gov/dep/dsr/trends2005/pdfs/climate-change.pdf)

### Changing Migration Patterns: Tree Swallow

Some species can change patterns in their drive to survive. However, a new rhythm takes over and throws everything out of synch with nature. Take the ubiquitous tree swallow, harbinger of spring--and of global warming. Warmer temperatures in the last three decades have prompted the small, graceful birds with the iridescent blue feathers to nest earlier. On its face, this could look like a good thing: Early nesting typically means more eggs. What's unknown is how the insects they rely on will change as the climate shifts--will prey adapt and also be available earlier each year? As biologists wait and watch, they also worry about what the climate changes could mean for "specialist" birds, such as flycatchers and warblers, whose diet is more limited and whose future is more precarious.

Source:

[www.defenders.org/newsroom/defenders\\_magazine/fall\\_2006/the\\_hot\\_ten.php](http://www.defenders.org/newsroom/defenders_magazine/fall_2006/the_hot_ten.php)

### Did you know...

*Across the United States and Canada, the tree swallow (*Tachycineta bicolor*) has been laying its eggs an average of 9 days earlier as May temperatures have risen.*

Source: P. O. Dunn and D. W. Winkler, "Climate Change Has Affected the Breeding Date of Tree Swallows throughout North America," *Proceedings of the Royal Society of London Series B*, 266 (1999): 2487-90.

### Suggested Fall Activity

#### Migration Barriers

*Students define migration as it relates to wildlife and suggest possible impacts caused by human activities.*

*Have students research monarch butterfly migration patterns and real-world human impacts affecting their population.*

NJCCS: 5.10.6 A1; 5.10.6 B1; 5.10.8 B1; 6.6.8 E 2

## Global Warming and Glaciers

By now everyone has heard about global warming or climate change. We read about it in the newspaper, see it on the news, and feel it in the change of weather patterns and our natural environments. One of the most noticeable changes is the effect of global warming on the Earth's glaciers. As average temperatures rise, glaciers are melting at an increased rate.

Glaciers are found on all continents, except Australia, and exist at almost all latitudes. The volume of ice, surface area, thickness and length of glaciers are dependent upon snow and ice accumulations and the amount of melting and sublimation that has occurred. While there are many factors that affect the accumulations of snow and ice and the rate of melting, scientists have found that temperature has the most influence. Glaciers' sensitivity to temperature change makes them a good indicator of what is going on with the Earth's climate. All over the world, glaciers are beginning to melt at an increased rate. In the Alps, for example, glaciers have lost approximately 30-40% of their volume and about half of their surface area. In Montana's Glacier National Park, there are only 27 glaciers today as opposed to 150 in 1910.

The shrinking of glaciers will have many effects on the environment. The normal melting of glaciers during summer months feeds freshwater rivers and streams. As the glaciers begin to retreat, they will still provide free flowing water, but the water flow will eventually dwindle. As the water flow decreases, it will have a great impact on wetland areas and the organisms that rely on glacial melt. Also, retreating glaciers will leave high elevation mountainsides exposed, thus affecting vegetative growth. These exposed areas will be susceptible to erosion and decreased stability.



*Did you know...*

*Sedge Island Natural Resource Education Center has an UNOFFICIAL blog? If you have visited the center and would like to share your experience visit [www.sedgeisland.com](http://www.sedgeisland.com).*

*Thank you for visiting, and enjoy!*



### Horseshoe Crabs and Global Warming

Horseshoe crabs have survived for millions of years with little change in their make-up. These "living fossils" play a very important ecological role and affect many other species of organisms, including humans. Many finfish and invertebrates feed on horseshoe crab eggs and larvae. Sea turtles that frequent the Delaware and Chesapeake Bays feed on the adult horseshoe crabs. However, those that rely on the horseshoe crab most are migratory shorebirds. These shorebirds fatten up on horseshoe crab eggs as they continue their journey north to their own breeding grounds. Humans also rely on horseshoe crabs, not as a food source, but for medical purposes. Pharmaceutical companies, to ensure that their injectable drugs are free of harmful bacteria, use an extract from horseshoe crab blood. As one can see, the horseshoe crab is a pretty important organism.

Thanks to conservation efforts, the horseshoe crab is still around today. Human development of seawalls and bulkheads threatened to take away the vital spawning grounds of these amazing creatures, but beaches, known as horseshoe crab spawning grounds, have been preserved. So how will global warming affect these creatures that have survived through the ages? According to scientists, sea levels are predicted to rise 20 inches by 2100 in Delaware Bay. This rise would result in greatly reducing the coastal wetlands and prime spawning habitat that the horseshoe crabs rely on, affecting more than just the horseshoe crab.

### Suggested Fall Activity

#### How Wet is Our Planet?

*Have students estimate the percentage of water distributed in glaciers. Discuss the importance of glaciers to areas where they are found and the impacts as they retreat.*

NJCCS: 4.1.5.A1; 4.1.6.A1; 4.1.7.A1,3; 4.1.8.A1,3; 4.1.8.B1; 4.2.5.D4; 4.2.6.D5; 4.2.7.D2; 4.3.7.C1; 4.3.8.C1; 4.4.5.A1-3; 4.4.6.A1-3; 4.4.7.A2; 4.4.8.A2; 4.5.5.A1-3; 4.5.6.A1-3; 4.5.7.A1-3; 4.5.8.A1-3; 4.5.5.C3-4; 4.5.6.C3-4; 4.5.7.C3-4; 4.5.8.C3-4; 4.5.5.E3; 4.5.6.E3; 4.5.7.E3; 4.5.8.E3; 5.1.8.B1,3; 5.3.8.A1; 5.3.8.B1; 5.8.6.B2; 5.8.6.D1; 5.10.6.B1; 5.10.8.B1; 6.6.8.B4; 6.6.8.E2

*Fall is an ideal season for enjoying and exploring the outdoors in New Jersey. From the panoramic views along the Appalachian Trail to the changing shoreline you can discover a New Jersey State Forest or Park. Log on to [www.state.nj/dep/parksandforests](http://www.state.nj/dep/parksandforests)*



**Northern Red Oak**  
New Jersey State Tree



The Dow Gardens Archive  
Dow Gardens, Bugwood.org

**But Timing is Everything!**

Autumn color usually starts in late September and ends in early November. The peak leaf viewing occurs around the first two weeks of October. Leaf color depends on many environmental factors, such as: weather, exposure to sunlight, soil conditions, and elevation. These factors are constantly changing the leaf color intensity. Timing is essential since peak color lasts only three to four days.

The main factor in leaf color change is the length of daylight. Around September 22nd, the autumnal equinox, both day and night will be approximately 12 hours. Towards the end of September, the daylight decreases at a rate of about two minutes per day: As the daylight decreases, the leaves of deciduous trees start to turn color and eventually fall off, preparing the trees for dormancy. Although temperature and moisture do not play a role in initiating the fall color change, they do affect their brilliance. The most brilliant colors occur when sunny fall days combine with crisp cool nights.

The fall season is a great opportunity to incorporate Project Learning Tree activities. The 2006/2007 Project Learning Tree Pre K-8 Environmental Education Activity Guide contains a Reading Connections feature that suggests relevant books for each Project Learning Tree activity and Technology Connections feature that provides a cross-reference of technology opportunities within PLT activities.

A good resource to print online photographs of forest species is [www.forestryimages.org](http://www.forestryimages.org) and check the [www.weather.com](http://www.weather.com) and [www.fs.fed.us/news/fallcolors](http://www.fs.fed.us/news/fallcolors) for fall foliage updates. As trees display their color this autumn, enjoy the outdoors with your students and Project Learning Tree as your guide.

**Project Learning Tree and Biodiversity**

Discover the new on-line secondary module Exploring Environmental Issues: Biodiversity. Found online at [www.plt.org/cms/pages/21\\_21\\_16.html](http://www.plt.org/cms/pages/21_21_16.html), this module covers such topics as invasive species and land use. Developed in partnership with the World Wildlife Fund, activities are easily integrated into science and social studies courses. Each online activity is correlated to Earth and Sky radio programs that can be downloaded and used to introduce the topics for students. Educators who use the materials are encouraged to provide feedback to the national PLT office through the website.

Check out the **Forest Resource Education Center** online at [www.njforestrycenter.org](http://www.njforestrycenter.org). You can order books, schedule school programs or find out about upcoming events at the 660 acre center in Jackson, NJ.

**SHRUBS & VINES**  
of New Jersey and the Mid-Atlantic States

*These two handsome spiral-bound booklets can be easily used by field botanists.*

*Both booklets aim to familiarize the user with the most common woody species in the area.*

*Each book is \$10 with discounts available for orders in quantities of 50.*

**TREES**  
of New Jersey and the Mid-Atlantic States

**Suggested Fall Activity**

**Looking at Leaves**

*Students will understand how leaf shapes, size and other characteristics vary from plant to plant.*

NJCCS: 5.1.4.A.1; 5.1.4.B.1; 5.1.4.C.1,2; 5.5.4.B.1; 5.6.2.A.1; 3.3.K.A.1,2; 3.3.K.B.1,2; 3.3.K.C.1; 3.3.1.A.1,2; 3.3.1.B.1,2; 3.3.2.A.1,2; 3.3.3.A.1,2; 3.3.3.B.2; 3.3.4.A.2; 3.3.4.B.5,6; 8.1.4.A.3; 9.2.4.C.5; 9.2.4.D.3; 9.2.4.F.1

**In an effort to save money on postage and printing, we would like to make *Branching Out* an online document. If you wish to continue receiving this newsletter, please send your email address to [Marc.Rogoff@dep.state.nj.us](mailto:Marc.Rogoff@dep.state.nj.us).**

## Water and Climate Change

At the recent USA Project WET Coordinators Conference, I attended two presentations that clarified the relationship between water, climate change and water resources.

In a presentation entitled "Climate Change 101 and the Changing Hydrologic Cycle", Mike Crimmins and Kerry Schwartz of the Arizona Cooperative Extension and the University of Arizona provided a clear picture of the factors that affect our climate and the role of greenhouse gases. In concluding, they made the following points:

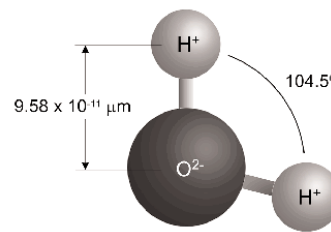
- The global climate system is a complex system moving energy and mass around continuously.
- Changes in green house gas concentrations are impacting the Earth's radiation balance.
- Climate change is real and happening now.

Denton Slovacek, Manager, Technical Consulting Services, Hach Company, reviewed the water molecule and its physical and chemical properties. Our water resources, due to their basic makeup and properties, will automatically react to climate change. How can we all teach these basic water concepts and assist people in making informed, educated choices and decisions related to climate change? Let's begin by looking at the water molecule.

The water molecule is unique in that it is non-linear. What does that mean? Denton gave us four things to remember about the water molecule, H<sub>2</sub>O:

- 1) Oxygen is the second most electronegative element.
- 2) This results in an uneven sharing of the paired O-H bonds.
- 3) The electrons of the shared pair are drawn closer to the nucleus of the O and further away from the nucleus of the H.

- 4) The two polar bonds and the bent structure result in a partial negative charge on the oxygen atom and a partial positive charge on each hydrogen atom.



It is this polar nature of water that is responsible for many of its unique properties. Because of this, liquid and solid water molecules are linked and do not behave as a singular molecule but as a 3-D net of molecules. Therefore, surface tension results from the greater attraction of water molecules to each other than for air. This link between molecules also leads to the unique property that water expands 9% in volume when it solidifies into ice. How will the unique properties react to climate change?

The global climate system may be complicated, but we clearly understand how water reacts to temperature change. It expands when it warms, and expands when it solidifies to ice. So, if we could picture an Earth with no polar ice caps, sea level would rise with each degree of temperature increase due to the expansion of the water. In our case, the melting of ice caps will increase the amount of liquid water in the oceans and add to increased sea levels. While the social and political debates on climate change and appropriate actions continue, water will react the way it has for millions of years. Teaching about these reactions and their relationships will help us all to make more educated decisions about our future.

New Jersey is especially vulnerable to the environmental, economic, and public safety effects of climate change, including the effect of sea level rise on the State's densely developed coastline from increased incidence and severity of flooding and storms. Likewise, the State's economy is especially vulnerable to the effects of climate change with our active ports, a vibrant agricultural sector and a significant coastal-based tourism industry. New Jersey has established a website to inform its citizens about global warming and what the state intends to do about it.

Source: [www.nj.gov/globalwarming](http://www.nj.gov/globalwarming).

To view the PowerPoint presentation of *Climate Change 101 and the Changing Hydrologic Cycle* visit <http://dcdc.asu.edu/dcdcmain/detail.php?cid=26&ID=106>

### Suggested Fall Activity

#### Hangin' Together

Students mimic the water molecule's special ability to hold onto other water molecules; they also present four properties of water that are critical to life on Earth.

NJCCS: 1.2; 1.2.8.C.3; 5.6; 5.6.12.A.6; 5.6.8.A.1; 5.6.8.A.2; 5.1.8.A.4; 5.1.8.B.1

Did you know...

Loss of wildlife and habitat --due to global warming-- could mean a loss of tourism dollars. In 2001, more than 2.3 million people spent nearly \$2.2 billion on hunting, fishing and wildlife viewing in New Jersey, which in turn supported 35,305 jobs in the state.

Source: [www.nwf.org/globalwarming/pdfs/NewJersey.pdf](http://www.nwf.org/globalwarming/pdfs/NewJersey.pdf)

Responding to the above comment, another parent scoffed:

*My son attended this show. He loved it and got a lot out of it. To those of you who worry about age-appropriateness, and unintended consequences, I say, "Oh come ON!" Obviously the critics haven't seen the show.... In America we've grounded out kids with materialism, egoism, violence, killing, convenience at any cost...and you're worried about Ecophobia? Never mind that we are past the point of pussy footing around. Our generation hasn't shown itself to have the gumption to fix our mess, so it falls upon our kids to actually do something. If we don't send children the message now while they're young, they'll grow up to be the greedy, consuming jerks we are.*

It's easy to see the virtue in both of these perspectives. Clearly both parents are after the same thing: figuring out the right way to educate children who will rise to the challenge of living ecologically responsible lives.

### Schools for Climate Protection

In light of the rapidly accelerating evidence of climate change, and the small window of opportunity in the next thirty years during which we might stabilize climate, the temptation is to jump to direct instruction. Global warming is breathing down our necks so let's educate the kids to do something about it! This is what motivated Lisa Shimizu to make her modified version of *An Inconvenient Truth*. And while this might be a virtuous endeavor, it's not the big answer. Instead, we have to take a deep breath and start to do the hard work of shaping classroom and school cultures that will grow stewardship behavior during the thirteen or so years of elementary through high school education.

The first thing we need to do is create comprehensive place-based education programs that connect children and curriculum to the nearby natural world. Keep in mind that much of the available research suggests a very strong link behind childhood nature experience and adult environmental behavior. Without that deep abiding sense of comfort in and love for the natural world, no amount of chastising about turning off the lights or biking to school is going to make a bit of difference.

Next, we have to design schools as communities of care. Schools are used to this mindset in regard to caring for people. The good work of the Northeast Foundation for Children, which trains teachers in the Responsive Classroom, is one example of shaping a positive classroom culture. The change here is that the ethic of care has to be extended to caring for the natural environment and eventually the global ecosystem. Just as teachers develop a set of classroom jobs where all children participate in the daily jobs that keep the classroom functioning, I recommend that schools develop incremental, progressive responsibilities for children at each grade level. These responsibilities would involve every teacher, student, and staff member in shaping a school environment that models environmental sustainability.

For example, some city and education leaders in Keene, New Hampshire, have started to explore the idea of "greening" the

local school district. Cities for Climate Protection is a nationwide initiative, in line with the international Kyoto Protocols, to reduce greenhouse gas emissions. Over the past five years, Keene has emerged as an acknowledged leader among small New England cities. The conversion of much of the cities fleet to bio-diesel, excellent recycling programs, the use of recaptured methane to generate power for the solid waste facility, and a willingness to redesign some of the road infrastructure to facilitate the reduction of car emissions are all illustrative of conscious local attempts to green the city.

The idea is to extend Keene's Cities for Climate Protection initiative with a parallel Schools for Climate Protection initiative. The goal would be to evolve the curriculum, staff development, and facilities management aspects of the schools so as to cultivate an ethic of stewardship in Keene students, reduce the greenhouse gas emissions of school operations, and provide models of low impact lifestyles to the broader Keene community.

One core precept of this approach would be to create a developmentally appropriate, school wide model, a Ladder of Environmental Responsibility, which honors the learning dispositions and capabilities of students and teachers at the elementary, middle and high school levels.

This Ladder would provide a set of incrementally more challenging tasks for children throughout their school career. One small independent school in St. Louis has a continuum of outdoor education challenges. In first grade, children do a simple overnight on the schoolyard, in fifth grade they relive Tom and Becky's night in a Missouri cave, by eighth grade they do a weeklong urban service week in a southern city. What we're looking for is a set of stewardship responsibilities for each grade level in the school.

In order to cultivate long-term environmental behavior, it's important to provide ongoing training in environmental activism. The best way to do that is by embedding children in a culture that gradually ups the ante of responsibility as children mature. Children are expected to identify problems, devise solutions, advocate for change, meet barriers, accept defeat, celebrate successes, keep trying. By working on small, manageable, cognitively accessible environmental problems at the micro level, we'd be developing the sense of agency, the locus of control that Hungerford and Volk (1990) identify as one of the crux elements in shaping persistent stewardship behavior. It's this kind of cultural modeling that will provide the durable commitment to dealing with the more expansive, heavy problems of global warming at the community, regional and national levels as children become adolescents and adults.

Just a pipe dream? I don't think so. Pieces of this kind of approach have taken root in schools across the country. Schools are rethinking school lunch, creating biodiesel for school vehicles, initiating anti-idling campaigns, creating schoolyard wildlife habitats. The Ladder of Responsibility is an idea just waiting to happen. Be the first school in your community to create one and then let us know how it's working.

### Environmental Education and the No Child Left Behind Act

Congressman John Sarbanes has introduced the No Child Left Inside Act of 2007 to the House Committee on Education and Labor (H.R. 3036). This bill urges Congress to include critical environmental education measures in the No Child Left Behind law.

With the nation facing complicated environmental issues that will challenge us for years to come, it is critical that schools provide students with a solid grounding in environmental education. But because of the No Child Left Behind Act (NCLB), many schools are scaling back or eliminating environmental education programs. Congress has the opportunity to change this with the reauthorization of NCLB.

The language in the No Child Left Inside Act of 2007 recommends including environmental education in NCLB in these ways:

- Provide incentives for state educational agencies to create a State Environmental Literacy Plan for integrating environmental education into their K-12 curriculum to ensure that graduates are environmentally literate.
- Provide funding to help states, schools systems, and environmental education partners to implement the State Environmental Literacy Plan.

By making a few changes to NCLB, we can dramatically improve our schools' ability to prepare children for real-world challenges and careers - and ensure an environmentally sustainable future.

Source: [www.eeNCLB.org](http://www.eeNCLB.org)

### Global Warming and Monarch Extinction

Photo by Liz Jackson



Global warming is a serious threat to monarch migration through its affect on weather and climate in the monarch's winter sanctuaries in Mexico. In January 2002, possibly 80% of the Mexico overwintering monarchs were killed by a severe winter storm. It may seem alarmist to worry about the disappearance of the monarch migration, when monarch populations still number in the tens of millions, but numbers give no immunity to extinction. The passenger pigeon was the most common bird in North America in the 1800's, numbering in the billions. By the early 20th century, it was extinct. And global warming is a threat to more than just monarchs. A 2003 British study predicts that climate change in the next 46 years (within your students' lifetime) will lead to conditions that could bring about the extinction of nearly a quarter of the world's land animals. For example, Australia could lose as many as 54% of its 400 species of moths and butterflies. A study of monarchs leads inevitably to the topic of global warming and its consequences for people, wildlife and the planet.

Source: [www.eirc.org/global\\_connections/whyteachwithmonarchs/179](http://www.eirc.org/global_connections/whyteachwithmonarchs/179)

### Earth Day Network



Another dinosaur whose time has gone is the inefficient incandescent light bulb. Earth Day Network is aggressively pushing for the phase-out of traditional bulbs in favor of compact fluorescent bulbs (CFLs) and other energy efficient lighting.

If every American home replaced five of their inefficient incandescent light bulbs with efficient, Energy Star-approved bulbs, the reduction in carbon emissions would be equivalent to taking 8 million cars off the road. That is why EDN has launched the *Pledge to Switch Your Light Bulbs* campaign; thousands of concerned environmentally-aware citizens have already pledged. Won't you be next? Pledge now!

Source [www.earthday.net](http://www.earthday.net)



### References for Global Climate Change Meets Ecophobia

- 1) Finger, Matthias, "Does Environmental Learning Translate into More Responsible Behavior?" *Environmental Strategy: Newsletter of the IUCN Commission on Environment, Strategy and Planning* 5 (Feb, 1993).
- 2) Hungerford, Harold and Trudi Volk, "Changing Behavior through Environmental Education," *Journal of Environmental Education* 21, no. 3 (Spring, 1990).
- 3) Slivovsky, Katie Johnson, "My Turn: 'Save the Elephants-Don't Buy Ivory Soap'" *Newsweek*, 16 August 2004.



### Monarch Teacher Network Mexico Migration 2008

"Teaching and Learning with Monarch Butterflies" has just wrapped up its 2007 season by training (in cooperation with Canadian partners, MTN – Canada [www.monarchcanada.org](http://www.monarchcanada.org) ) over 400 teachers at ten workshops in New Jersey, Connecticut, Ohio, Virginia, Ontario and Manitoba.

MTN is now planning three Mexico trips:

February 16-23, 2008

March 8-15, 2008

February 9-16, 2008 **Tentative**

The trips are for teachers, spouses and interested adults. Information and fellowship applications can be found at [www.eirc.org/global\\_connections/infoforthemexicotrip/183](http://www.eirc.org/global_connections/infoforthemexicotrip/183). There is limited space on each trip. We will register people for the trips as we receive their application/deposit. If you have trip-related questions, please email Erik at [erikm@eirc.org](mailto:erikm@eirc.org).

# PROFESSIONAL DEVELOPMENT WORKSHOP SCHEDULE

October 12 Project WET  
Lighthouse Center for Natural Resources Education, Waretown NJ  
9 am - 3 pm; \$15 - Includes light snack & lunch  
732-932-9271

October 17 Project WET  
South Branch Watershed Association, Flemington, NJ  
9 am - 3 pm; \$25 - Includes light breakfast & lunch  
908-782-0422 x14

October 17 Project WET  
Camden County Environmental Education Center, Sicklerville, NJ  
9 am - 3 pm; \$10 - Includes light snack  
732-932-9271

October 18 Project Learning Tree  
Great Swamp Outdoor Education Center, Chatham, NJ  
9 am - 3 pm; pm \$10

October 25 Healthy Water Healthy People  
Essex County Environmental Center, Roseland, NJ  
9 am - 3 pm; \$20 - Includes light snack  
973-228-8776

October 30 Project WILD  
Pyramid Mountain Natural Historic Area, Boonton NJ  
9am -3 pm; \$10 fee - includes breakfast, bring a lunch  
973-334-3130

November 1 Healthy Water Healthy People  
Trailside Nature Center, Mountainside, NJ  
9 am - 3 pm; \$10 - Includes coffee and donuts  
908-789-3670 x3430

November 3 Project WET  
Camden County Environmental Education Center, Sicklerville, NJ  
9 am - 3 pm; \$10 - Includes light snack  
732-932-9271

November 16 Healthy Water Healthy People  
Manasquan Reservoir Education Center, Howell, NJ  
9 am - 3 pm; \$35  
732-842-4000

December 3 Project WET  
Palmyra Cove Nature Park, Palmyra, NJ  
9 am - 3 pm; \$10 - Includes light snack  
856-829-1900 x267

December 5 Project Learning Tree  
Liberty State Park Interpretive Center  
8:30 am - 3 pm; \$6, (\$3 for ANJEE members)  
201-915-3409

December 6 Project WILD  
Trailside Nature and Science Center, Mountainside NJ  
9am -3 pm; \$25 fee - includes breakfast, bring a lunch  
908-789-3670 ext. 3430

December 7 Project WET  
Manasquan Reservoir Education Center, Howell, NJ  
9 am - 3 pm; \$25  
732-842-4000

January 12 Project WET  
Camden County Boat House, Pennsauken, NJ  
9 am - 3 pm; \$15 - Includes light snack  
732-932-9271

February 20 Project Learning Tree  
Somerset County Ted Blum 4-H Center, Bridgewater, NJ  
9 am - 3 pm; \$25 - Includes lunch  
908-526-6644

February 28 Project Learning Tree  
Pyramid Mountain NHA, Boonton, NJ  
9 am - 3 pm; \$10  
973-334-3130

March 13 Project Learning Tree  
Trailside Nature and Science Center, Mountainside NJ  
9 am - 3 pm; \$10  
908-789-3670 ext. 3430

March 29 Project WET  
Morris Museum, Morristown, NJ  
9:30 am - 3:30 pm; \$30 - Includes light breakfast, lunch  
973-971-3710

April 4 Project WET  
Palmyra Cove Nature Park, Palmyra, NJ  
9 am - 3 pm; \$10 - Includes light snack  
856-829-1900 x267

April 16 Project WILD  
Somerset County Ted Blum 4-H Center, Bridgewater, NJ  
9 am - 3 pm; \$25 - Includes lunch  
908-526-6644

April 18 Project WILD  
Hackettstown Natural Resource Education Center, Hackettstown, NJ  
9 am - 3 pm; \$20 - Includes light breakfast, bring lunch  
908-637-4125

April 19 WILD School Sites  
Hackettstown Natural Resource Education Center, Hackettstown, NJ  
9 am - 3 pm; \$20 - Includes light breakfast, bring lunch  
908-637-4125

May 1 Project Aquatic WILD Workshop  
Stony Brook-Millstone Watershed Assoc., Pennington, NJ  
9am -3pm; \$40 fee - includes morning refreshments; bring a lunch  
609-737-7592

May 8 Project WET  
SPLASH Steamboat, Lambertville, NJ  
9 am - 3 pm; \$29 - Includes coffee & donuts  
732-932-9271

May 15 WOW! Workshop  
South Branch Watershed Association, Flemington, NJ  
9 am - 3 pm; \$25 - Includes light breakfast & lunch  
908-782-0422 x14

May 15 POW! The Planning of Wetlands  
Hackettstown Natural Resource Education Center, Hackettstown, NJ  
9 am - 3 pm; \$35 - Includes light breakfast, bring lunch  
908-637-4125

May 21 Project WET  
Somerset County Ted Blum 4-H Center, Bridgewater, NJ  
9 am - 3 pm; \$25 - Includes lunch  
908-526-6644

# ***TEACHING THE ENVIRONMENT***

**NJ Curriculum Resources for Teachers Linked to State Standards & Assessments**

The New Jersey Department of Environmental Protection (DEP) sponsors four nationally recognized, award-winning environmental education curriculum supplements in New Jersey. They are **Project WILD**, **Project WILD Aquatic**, **Project WET** (Water Education for Teachers) and **Project Learning Tree** (PLT).

Each "Project" features one primary activity guide with dozens of lessons that can be adapted for students in pre-school through the secondary grades. Offering over 300 lessons combined, the learner outcomes from these guides are correlated with the revised New Jersey Core Curriculum Content Standards and the state science assessments (NJ ASK, GEPA and HSPA).

**To view the database of "Project" lessons having learner outcomes that support core curriculum content standards and state science assessments, visit  
[www.nj.gov/dep/seeds/correlations.htm](http://www.nj.gov/dep/seeds/correlations.htm).**

Educators can use this database to see which progress indicators (in the curriculum content standards) and which test questions (in the state science assessments) are supported by lessons from all Project activity guides. Or, educators can review the curriculum correlation spreadsheet (in Excel) for each Project activity guide to determine these same linkages.

Funding for the development of this online correlation project was made possible by a grant received by DEP from the National Environmental Education Training Partnership. Department staff are also grateful to Mike Heinz, State Science Coordinator for the New Jersey Department of Education, for his assistance with training, research and grant preparation needs.



**Alliance for New Jersey Environmental Education**

Promoting and Improving Environmental Education for people of all ages in New Jersey

## **The 23rd Annual New Jersey Environmental Education Conference Achieving Through Environmental Education January 31-February 2, 2008 Princeton University, Princeton, NJ**

The New Jersey Environmental Education Conference is held annually for formal and nonformal educators, administrators, naturalists, interpreters from schools, nature centers, colleges, government agencies, and environmental groups. Plan to attend an exciting array of professional development and networking opportunities! Build your knowledge, enhance your skills, discover new resources, and discuss ideas that will inspire your efforts to educate others about the environment!

**For more information or to obtain a registration packet, send email to  
[ANJEE\\_president@yahoo.com](mailto:ANJEE_president@yahoo.com).**

**You can also visit [www.anjee.net/conference/index.html](http://www.anjee.net/conference/index.html)**

The Alliance for New Jersey for Environmental Education (ANJEE) was established in 1985 to provide a networking forum for New Jersey's environmental educators. We are an organization of dedicated individuals who devote time, energy, and resources to facilitate the advancement of environmental education in our local, state, and global communities.