

Climate Change Meets Ecophobia

by David Sobel

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 an August, 2004 *Newsweek*, Brookfield (Illinois) Zoo edu-

cator 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.

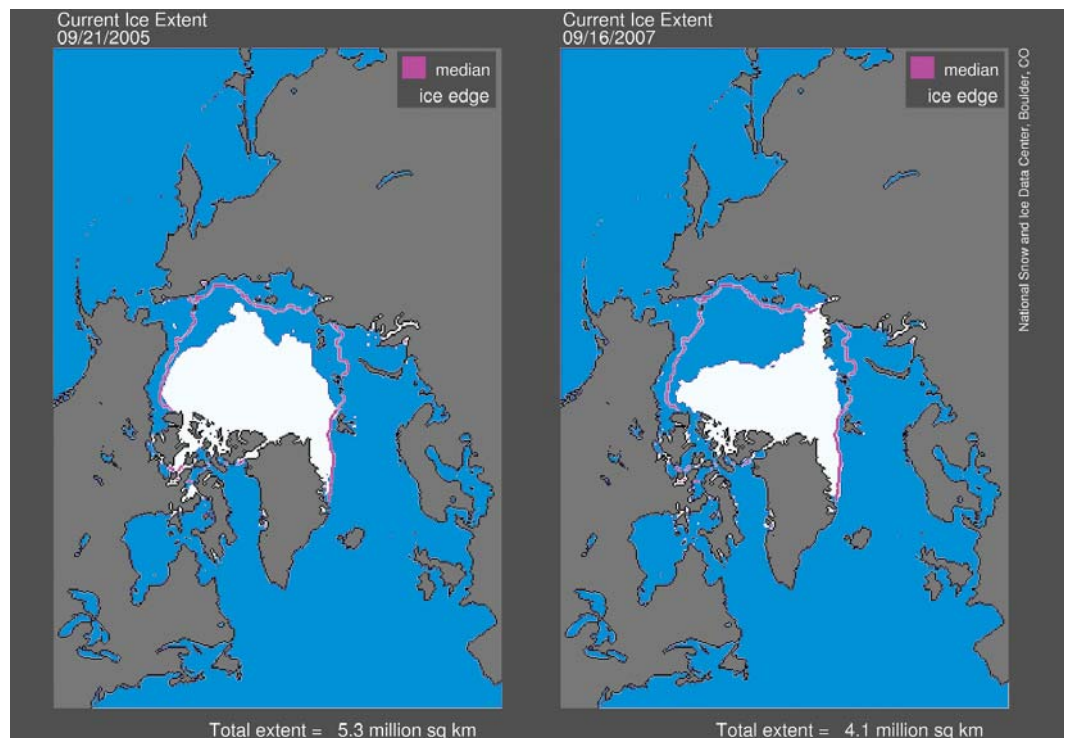
"L is for Las Vegas Frog . . . People built the city of Las Vegas and paved over all the freshwater springs where this frog used to live. Sadly, we say good-bye to the Las Vegas frog." The very last sentence of the book is, "Let's hope humans never become extinct."

"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 getting windier, and we need children to

This image from the National Snow and Ice Data Center shows a dramatic decrease in the arctic sea ice extent between September of 2005 and September, 2007. For more information: <http://www.nsidc.org>.



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.

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 slide show, *An Inconvenient Truth*. 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.

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 pussyfooting 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. Assuming that many of us agree on this point, let's look at what we know about creating learning settings that effectively cultivate ecological behavior.

Knowledge, attitudes, and behavior

Ten years ago I met with a prominent environmental funder in Boston to advocate for environmental and place-based education and how they help increase students' academic achievement. Impatiently, he responded,

The ice caps are melting, mosquito populations are expanding and spreading serious diseases, hurricanes are getting windier, and we need children to understand that it's their responsibility to fix these problems. But no pressure!

We've been spending way too much time focusing on conveying environmental knowledge and way too little time on developing environmental behaviors.

We can help children to understand their actions make a difference. Turning off the lights when we leave a room saves money.



“Well, test scores are all fine and good,” he acknowledged, “but what I really want to know is if these programs help kids become better stewards of the land and water. Does place-based education actually change their environmental behavior?”

Good question. And the answer to that has been changing over the past couple of decades. The conventional assumption in environmental education starting in the 1960's and 70's was that knowledge led to attitudes which led to behavior. In academic terms, Hungerford and Volk summarize, “If we make human beings more knowledgeable, they will, in turn, become more aware of the environment and its problems and, thus, be more motivated to act toward the environment in more responsible ways.”

Let's look at how this might work. We teach kids that burning gasoline in cars produces carbon dioxide and that carbon dioxide causes global warming. As a result, they develop the attitude that limiting one's consumption of fossil fuels is a good and virtuous thing to do. Then, when it's time for them to buy a car (here's the behavior), they'll opt for the Prius over the similarly-priced, flashier, but fuel-guzzling, Firebird.

Sounds good, but as Hungerford and Volk indicate, “Research into environmental behavior, unfortunately, does not bear out the validity of these linear models for changing behavior.” Or more simply, it ain't necessarily so. Just because children know that burning fuel creates carbon dioxide and that this is bad for the planet, they don't necessarily develop ecologically responsible buying patterns as adults. Increased knowledge and change in attitudes doesn't necessarily translate into different behavior.

One of the problems with this model is its

assumption that knowledge precedes behavior. Schools have construed this to mean that it's the school's responsibility to provide the knowledge and maybe the attitudes now—the behavior will take care of itself in the future. So we assume that all this good learning will lead to good behavior later. This, in turn, means we are less likely to use schools to practice, in little ways, the behaviors we want children to develop in bigger ways later on.

It also turns out that the pathway to responsible environmental behavior is a bit more complicated than: knowledge leads to attitudes leads to behavior. It's more like: a sense of agency and control leads to the knowledge of issues and action strategies, which lead to an intention to act, which under the right precipitating conditions, leads to environmental behavior.

One of the first things you help children to learn is that their behavior makes a difference. Your feeding the kitty keeps the kitty healthy. Turning off the lights when you leave the room saves us money. This sense of personal responsibility leads to wanting to understand why turning off the lights saves money and why turning off the lights reduces carbon dioxide production. The sense of agency leads to a desire for knowledge and a desire to know other skills for reducing carbon dioxide production. This leads to the intention to make other changes, if and when the choices present themselves, which leads to responsible environmental behavior.

At the risk of gross over-simplification, what this suggests is that small behaviors lead to knowledge and attitudes, which lead to medium-sized behaviors, which lead eventually to bigger behaviors. But keep in mind that behaviors are only possible when choices present themselves. If the nearest Prius dealer is 100 miles away, you're probably going to buy the Firebird. If you really believe in recycling, but there's no convenient paper recycling system in your classroom, you're probably going to throw the paper away.

This is all a long-winded way of saying that we've been spending way too much time focusing on conveying environmen-

tal knowledge and way too little time on developing environmental behaviors. In addition, in most schools, we've got a situation of, "Do as we say, not as we do." We disseminate knowledge about how environmental systems work but we don't design schools to be models of sustainable systems and, as we know, actions speak louder than words.

Catastrophe and ecophobia

Then there's also the issue of ecophobia—my contention that the overwhelmingness of environmental problems can breed a sense of ennui and helplessness. A fascinating study by the Swiss National Science Foundation (Finger, 1993) looked at the relationship between different kinds of environmental knowledge and environmental behavior in Swiss adults. The study compared adults whose knowledge about the environment was based mostly on media presentations of ecological catastrophes vs. adults whose knowledge about the environment came from extensive nature experiences and activism, mostly at the local level.

Finger found that, "Environmental behavior is less the result of learning and knowledge and more the result of particular environmental experiences," and that, "... some environmental learning does not necessarily translate into more responsible behavior towards the environment and can even be counter-productive."

In other words, too much knowledge about environmental tragedies actually discourages environmental behavior. Knowledge decreases behavior! If global warming is a done deal, why should I bother to do anything about it? If this is true for adults, who have well-developed capacities to shield themselves from information overload, think how this must be affecting children.

The author concludes his study with recommendations for environmental education programs:

First, "Nature experiences seem to be a necessary condition for any type of environmentally responsible behavior. . . . In particular, nature experiences should be provided for the youngest generation."

Second, "Experiences of environmental activism emerge as another crucial condition for any environmental behavior. . . . It is necessary that social and collective action be an integral part of any continuing education activity."

Third, "Fear and anxiety of environmental problems has the potential to turn environmental education into a counter-productive activity." Therefore, education about the problems should be substantially counterbalanced by opportunities to address the problem constructively.

Fourth, "When low fear is involved, environmental knowledge and information do make a difference in terms of environmental behavior."

Resonating with Finger's first suggestion above is a 2005 Cornell study by Wells and Leckies that looked at the relationship between childhood experience and adult environmental behavior. They found that, "Childhood participa-

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tion in “wild” nature, such as hiking or playing in the woods, camping, and hunting or fishing, is positively associated with environmental behaviors in adulthood.” Rather than taking eight-year-olds to the Global Warming slide show, it might be more useful, in the long run, to take them fishing or blueberry picking.

What does this all mean for what we do on Monday regarding global climate change education with children? Let's bring together these guidelines with the previous discussion about the relationship between knowledge, a sense of agency, and environmental behavior.

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. To do this we should honor the recommendations of the Swiss National Science Foundation above.

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 city's 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.

The Ladder of Responsibility

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. In traditional agrarian cultures, this Ladder of Responsibility is often seen in children's progressive responsibility for chickens in early childhood, goats in middle childhood, and a horse or cow in early adolescence. The knowledge required, the care-taking skills and the size of the animal increase with the competence of the child.

Similarly, 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.

How would this work in a K-6 public school? The teachers and staff would divide the environmental care of the school into seven increasingly sophisticated rungs of environmental responsibility. Each grade level would be assigned to one of the rungs of the ladder. The tasks would involve some kind of daily or weekly attention. The Ladder would be devised in conjunction with the state-mandated curriculum.

Certainly, the science curriculum is one consideration, but all aspects of the language arts, math, and social studies curricula would be considered as well. For instance, garden maintenance responsibilities would be allocated to the grade level in which the Growing Plants science unit is taught. The sixth-grade language arts curriculum focus on persuasive letter writing would be connected to the letters



home to parents about not idling their cars when parked in front of the school. A sample Ladder appears on page 20.

Going back to that Swiss National Science Foundation study, the second recommendation was that, "Experiences of environmental activism emerge as another crucial condition for any environmental behavior. It is necessary that social and collective action be an integral part of any continuing education activity." My translation of this recommendation is that, 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 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

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LADDER OF ENVIRONMENTAL RESPONSIBILITY A Model for Elementary Schools	
K:	Seasonal School Beautification: Teachers and students responsible for weekly displays of flowers, rock gardens, winter twigs, and the natural displays that fit with seasonal celebrations of the solstices and equinoxes.
1st:	Flower Garden Maintenance: Teachers and students weed the gardens, put them to bed for the winter, start seedlings in the late winter, run the plant sale in early spring, bring the garden to life, install new plantings.
2nd:	Schoolyard Vegetable Gardens: Teachers and students install raised beds, test and amend the soil, harvest vegetables, arrange for the harvest festival, put the garden to bed, put up the pickles, order the seeds in the spring, plant the garden, organize the volunteers for summer maintenance.
3rd:	Maintaining the Schoolyard: Teachers and students keep the nature area or schoolyard clean, devise graffiti and vandalism prevention programs, help to teach schoolyard games, work with school maintenance staff, create homes for wildlife, keep the bird feeders full, keep the running record of birds that visit the feeders.
4th:	Running the Recycling Program: Teachers and students design and run the paper-recycling program. They collect the paper and bring it to the collection site, and they monitor classroom and school use in hopes of decreasing paper usage. Systems for other materials such as glass, aluminum cans, and inkjet printer cartridges are developed as the system matures.
5th:	Tending the Composting Program: Teachers and students work with school lunch staff to first design a pre-consumer composting program and eventually a post-consumer program. Fifth graders educate new students about what's compostable and what isn't. They also staff the post-lunch separation process. When the system matures, post-snack systems are developed as well.
6th:	Climate Change Team: Teachers and students are responsible for minimizing the carbon dioxide output of the school. They accomplish this with yearly projects to monitor and reduce electricity, heating fuels, and water consumption in the school. Students suggest changes in student/teacher/staff behavior to reduce consumption. Students and teachers work with building maintenance staff to use the healthiest cleaning products with the least emissions.



As students grow older, they take on more complex outdoor challenges.

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. ✍️

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Resources

- Finger, Matthias, "Does Environmental Learning Translate into More Responsible Behavior?" *Environmental Strategy: Newsletter of the IUCN Commission on Environment, Strategy and Planning* 5 (February 1993).
- Hungerford, Harold and Trudi Volk, "Changing Behavior through Environmental Education," *Journal of Environmental Education* 21, no. 3 (Spring 1990).
- Slivovsky, Katie Johnson. "My Turn: 'Save the Elephants—Don't Buy Ivory Soap,'" *Newsweek*, August 16, 2004.
- Sobel, David, *Beyond Ecophobia: Reclaiming the Heart in Nature Education*, Nature Literacy Monograph Series #1. Great Barrington, MA: The Orion Society, 1996.
- Van Schagen, Sarah. "Child's Play: Can Al Gore's Message be tailored for kids?" *Grist: Environmental News and Commentary* (March 16, 2007). <http://www.grist.org>.
- Wells, Nancy and Kristi Lekies. "Nature and the Life Course: Pathways from Childhood Nature Experiences to Adult Environmentalism." *Children, Youth and Environments* 16, no. 1 (2006). <http://www.colorado.edu/journal/cye/>.