

# Land, Legacy and Learning III

A Master Plan for  
Environmental  
Education in  
Kentucky and the  
2009 Survey of  
Environmental  
Knowledge,  
Attitudes  
and Behaviors



Sponsored by: The Kentucky  
Environmental Education Council,  
An agency of the Education and Workforce  
Development Cabinet

Steven L. Beshear, Governor  
Helen Mountjoy, Secretary

2009 Edition



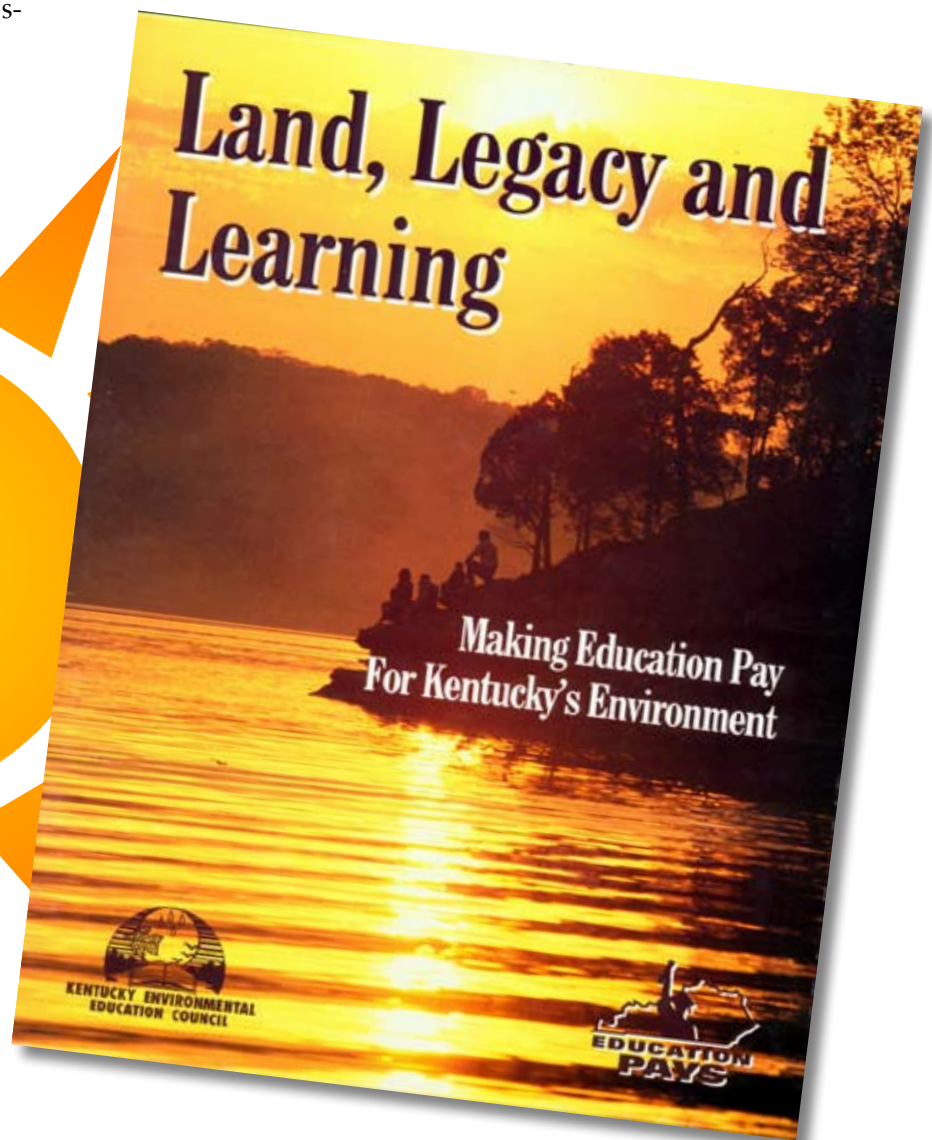
# A Master Plan for Environmental Education in Kentucky

In the ten years since the first Land, Legacy and Learning was created, Kentucky has gained recognition as one of the top states in the country with respect to innovative and comprehensive environmental education programs and policies.

For example, during that period, three Kentuckians have served as President of the North American Association for Environmental Education, an international association of environmental educators. Several others have served on its board of directors. Kentucky also leads the nation in the number of environmental educators who have completed a comprehensive, standards-

based professional development program. In addition, Kentucky is the only state in the nation with a network of university-based environmental education centers.

What follows is a list of accomplishments in environmental education in the ten years since the creation of the first Land, Legacy and Learning in 1999. Each of these is tied in some way to the recommendations in that 1999 plan and in the updated plan written in 2004. In the same way, this current plan (2009) will serve as a guidebook for continuing to improve environmental education for the next five years.



# Accomplishments



- Recommendation one in both the 1999 and 2004 plans called for making environmental literacy a part of teacher certification. We continue to move closer to that goal thanks in large part to the assistance of Kentucky's Education Professional Standards Board (EPSB). In 2003, the EPSB approved the creation of an endorsement in environmental education. The endorsement means that colleges and universities across the state now offer specialized training for teachers who wish to learn better strategies for using environmental education in their classrooms. Currently, six of the eight state universities either currently offer or will very soon offer the EE endorsement to teachers.

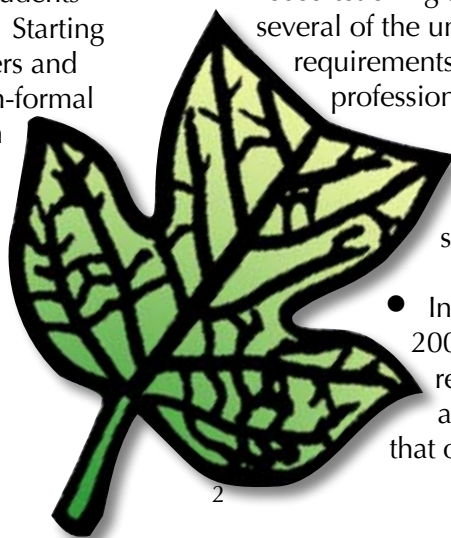
- Working from positions of leadership in the national environmental education community, several Kentuckians were successful in having the North American Association of Environmental Education accepted as one of the national partners to the National Council for the Accreditation of Teacher Education (NCATE). NCATE is the organization that accredits all colleges of education in Kentucky and in many other states as well. Thus, this partnership means that in coming years, teacher education programs in Kentucky and across the country will be leveraged to begin incorporating environmental education into what teachers must know to be certified.

- Recommendation three in the 2004 plan called for all environmental education materials, content and programs in the Commonwealth to be based on state and/or national standards for what students should know and be able to do. Starting with the endorsement for teachers and the certification program for non-formal environmental educators, which are both based on the national EE standards and moving to the Kentucky Program of Studies and Core Content for assessment, virtually all environmental education in the Commonwealth is now aligned to a set of rigorous academic standards.

- Recommendation six in the 2004 plan called on school districts across the state to implement policies and programs that provide a healthy learning environment for students and to model sustainable practices. In 2007, the Kentucky Environmental Education Council and the Kentucky Department of Education launched a new program called the Kentucky Green and Healthy Schools Program. This program, cited as one of the top six environmental education curricula in the nation in 2008 by the U.S. Green Buildings Council, allows students to conduct environmental audits of their own school environments and then to implement improvement projects to make those environments healthier and more sustainable. In addition, the Kentucky Green and Healthy Schools Task Force created a Kentucky Design Manual to help those districts wishing to build energy efficient, healthier schools gain recognition for their efforts.

- Both plans called for the improvement of environmental education at the college level and charged the state universities to lead the way in this effort. Between 2003 and 2009, with startup funding from federal grants and continuing support from the state's Pride bond fund created by the General Assembly in 2002, the Kentucky University Partnership for Environmental Education was formed. This partnership, comprised of centers for environmental education at each of the eight state universities, is the only such network in the United States. To date, this network has created endorsements in EE around the state, infused teaching about the environment into several of the universities' general education requirements and offered continuing professional development in EE for practicing teachers. The network also provides a strong opportunity for seeking independent funding.

- In both 1999 and 2004, the plan contained recommendations that agencies and organizations that offer EE should collaborate





and combine resources to reach Kentucky's adults and students. One such program was launched in 2005 to help Kentuckians better understand the sources of water pollution. While that program has ended, many of the products it created, including a website, logo, documentary and KET electronic field trip to a watershed continue to be used by agencies and organizations across the state.

- Recommendation fourteen in the 1999 plan and recommendation twelve in the 2004 plan directed the Kentucky Environmental Education Council to conduct a survey of environmental knowledge, attitudes and behaviors every five years and to compare data from those surveys to keep track of how and what Kentuckians think about their environment. The University of Kentucky Survey Research Center has administered this survey every five years, and the results of the 2009 survey are included in this publication.

- In both 1999 and 2004, the first recommendation in the section on "Creating an Efficient System" called for the full funding and staffing of the Kentucky Environmental Education Council. This would mean a substantial increase from its base funding of \$150,000 per year from environmental fines and penalties and an increase from two staff members to four. In 2002, the General Assembly passed HB 179 which, beginning in 2004, provided to the KEEC the interest from the state Pride Fund, a fund created to clean up abandoned landfills. The overwhelming majority of these funds were provided to the state universities to create the EE Endorsements, infuse environmental content into the General Education requirements and increase the number of professional development opportunities for practicing teachers. As the principal of the Pride Fund has been spent (and as the economy has weakened), the interest has been gradually decreasing, and more stable funding will need to be found when the economy recovers. However, on a bright note, in 2009, the Beshear administration allowed KEEC to add an

additional full-time staff person to administer the Green and Healthy Schools Program, and this will allow the agency to take on some of the new responsibilities outlined in this 2009 plan.

- Recommendation nineteen in the 1999 plan directed the Kentucky Environmental Education Council to provide professional development opportunities for non-formal environmental educators (those who teach about the environment but are not employed as classroom teachers). In the 2004 plan, this recommendation was repeated (this time as number seventeen) and the Task Force added specific content that such a program should provide.

In the spring of 2005, the Kentucky EE Certification Task Force launched the environmental education certification program for non-formal environmental educators. Based on the national standards called "Guidelines for the Initial Preparation of Environmental Educators," the program, which is administered by the Kentucky Environmental Education Council, includes rigorous coursework and authentic assessments. It also models best practices in environmental education. With the graduation of the 2008 class, the year-long program had trained 121 Kentuckians to be more competent environmental educators, including providing them with the five specific skills named in recommendation fourteen of the 2004 plan. Of the handful of states currently offering standards based EE certification; Kentucky has by far the largest number of graduates.

- Finally, the 2004 plan charged the environmental education community to reach out to other educators and community members with whom they have not traditionally worked. Though this is only a first step, since 2004, due to efforts by the EE community and to an increased interest in the environment generally, many new partners have joined efforts to improve environmental education in the Commonwealth. These include (but are not limited to) architects and the construction industry, health care providers, transportation officials, city and county governments, building operators and volunteer organizations.



# Helping Kentuckians Understand their Environment

Our state, nation and planet face a growing list of environmental problems. Some, such as littering, impede our economy and blight our landscape. Others, such as water and air pollution, affect both our economy and our health and the health of our children. Everything humans need to live, including clean air and water, shelter, and wholesome food, comes from the environment. Beyond our basic needs, a growing body of research shows that people, especially children, need a daily dose of time spent in green spaces, along with our daily bread, to be healthy and whole human beings. These findings should not be surprising to Kentuckians, who live in one of the most beautiful places on Earth.

Perhaps because a healthy environment is so necessary to our very survival, issues surrounding it are often controversial and discussions over these issues are fraught with hyperbole and often with conflicting statistics. Added to this is the fact that environmental issues (and the environment itself) are highly complex. Taken together these facts make it extremely difficult for even the most well-meaning policymakers to address the issues rationally. Thus environmental problems languish and become more and more difficult and expensive to remediate.

Reduced costs for environmental remediation, not to mention improved health for our children and a stronger more sustainable economy, are just a few of the outcomes a more environmentally literate citizenry would bring to the Commonwealth. Realizing the need to improve environmental literacy in Kentucky, the Legislature created the Kentucky Environmental Education Council as a state agency in 1994. The Legislature charged the Council to:

- Create and update a five-year management plan to improve environmental education programs

- Establish an interagency subcommittee, made up of state agencies that do environmental education, to advise the Council
- Establish regional environmental education centers at all state universities and establish a competitive system for awarding grants to these centers
- Seek private support for funding environmental education programs in the state
- Assist to integrate and evaluate environmental education in school curricula
- Monitor the environmental literacy of Kentuckians
- Make recommendations to promote environmental literacy in Kentucky

In 1999, the Kentucky Environmental Education Council issued Land, Legacy and Learning I, the first comprehensive plan to improve environmental education and environmental literacy in the Commonwealth. For that document, citizens from across the state and from many different environmental perspectives came together to meet, discuss, compromise, write and rewrite. The result was an outstanding document that has been used by numerous other states and provinces as a model for their own state environmental education plans.

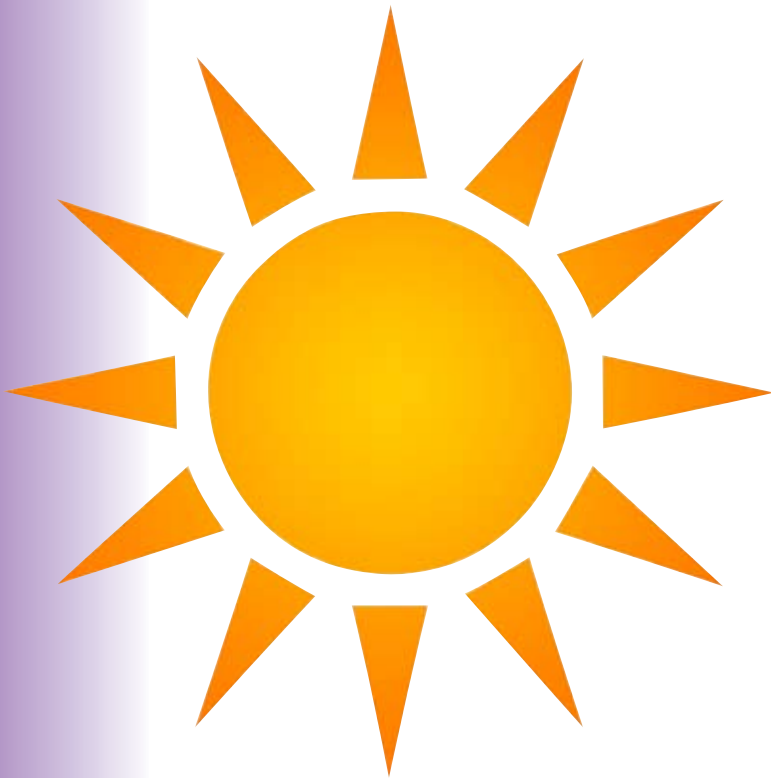
In 2004, a new Kentucky Environmental Education Task Force reviewed the original document and agreed with its basic premise that Kentuckians must be taught the basic concepts and skills they need to make rational decisions about the environment. The twenty recommendations in the 1999 plan and the nineteen in the 2004 plan outlined ways to achieve that goal. Many of the strategies outlined in the first two plans have been





implemented (see “Accomplishments,” page 2), others are still to be realized, and other new challenges and opportunities have arisen during the past five years. Therefore, the recommendations in the 2009 plan both continue to support the goals of the earlier plans and add new strategies for achieving those goals. Land, Legacy and Learning III lists sixteen recommendations, each followed by a brief explanation. Recommendations are grouped under four major headings:

- **Teaching Our Children**
- **The Role of Colleges and Universities in Preparing Educators and Future Leaders**
- **Educating Kentucky’s Adults**
- **Creating an Efficient and Exemplary System**



The recommendations are numbered consecutively and are not in any priority order. While grouped for clarity, the recommendations are strongly related to each other, and those in one section often support those in another.

Some acronyms and other terms used in the document may need definition. These include:

**Task Force** – Refers to the 2009 Kentucky Environmental Education Master Plan Council Task Force

**EE** – environmental education

**KEEC** – the Kentucky Environmental Education Council, the state agency, in the Education and Workforce Development Cabinet, that is charged by the legislature to improve environmental education in the Commonwealth

**KAEE** – the Kentucky Association for Environmental Education. KAEE is the non-profit professional organization of environmental educators.

**EPSB** – The Education Professional Standards Board is the board that oversees the certification process for Kentucky teachers.

**KUPEE** – The Kentucky University Partnership for Environmental Education is the network of environmental education centers at the eight state universities

**NAAEE** – the North America Association for Environmental Education, the multinational professional association for environmental educators

**NCATE** – The National Council for the Accreditation of Teacher Education, the organization that sets accreditation standards for most of the colleges of education across the U.S. including all those in Kentucky.



# Teaching Our Children

While environmental education is important to citizens of all ages, there is no doubt that children are its primary beneficiaries. Ensuring that every child in the state receives a balanced, academically-based environmental education as part of the curriculum is central to improving environmental literacy in Kentucky. This section begins with the recommendation that environmental literacy become part of teacher certification. This is the third time in which this recommendation has been placed at the top of this section of the plan, indicating its importance in improving environmental literacy in the Commonwealth. By improving the environmental literacy of teachers, this single recommendation would significantly improve environmental literacy among Kentucky's young people.

We continue to advocate for an environmental education consultant in the Kentucky Department of Education. This year, there is the real possibility of federal funding for such a position. We also recommend that schools model appropriate environmental practices through such actions as energy conservation, reducing solid waste, improving indoor air quality and protecting local water resources. Finally, we strongly recommend that a significant percentage of environmental education instruction take place outdoors where students can see at first hand the beauty and patterns of natural systems and also learn how human systems affect natural systems.

**1. Environmental literacy, as outlined by the North American Association for Environmental Education K12 standards (see appendix A), should be a required part of teacher certification.**

To have environmentally literate citizens, we must have environmentally literate teachers. Since the first master plan was created in 1999, two major steps have been taken to move us closer to a teaching force with solid knowledge of how our environment

works and how to teach our children about it. Kentucky now has an Endorsement in EE and the National Council of Teacher Education has included environmental education in the standards it provides to colleges and universities. (See appendix B for a summary of the national EE standards for preparing educators.)

While the two steps listed above are encouraging and should have significant payoffs in coming years, the Task Force calls on the Kentucky Education Professional Standards Board to reinstate Environmental Education as a "theme" for teacher education programs. We believe this would insure a faster track toward environmental literacy for teachers.

**2. Environmental education content, materials and programs should be based on the criteria listed below. Environmental education should:**

- Use place-based instruction
- Be interdisciplinary
- Include authentic assessments
- Use inquiry-based approaches that lead to problem solving and critical thinking
- Use scientific processes to study natural and human systems
- Serve all students
- Address social, cultural, and physical diversity

The purpose of this recommendation is to raise both the quality and consistency of the methods used to teach our students about the environment. Many teachers already know that environmental education is good





education. National research <sup>1</sup> shows schools that use their local environments as a theme to integrate the curriculum make strong gains in numerous educational outcomes including standardized test scores, the ability of students to solve real-world problems, and the reduction of discipline problems.

**3. In order to provide meaningful, engaging environmental education and nurture healthy children, formal and non-formal educators should provide significant outdoor opportunities for children to connect with the natural environments in which they live.**

American children spend much less time outdoors than did their parents and certainly their grandparents. A recent study found that ten-year-olds in the United States can name an average of 1000 corporate logos but fewer than ten things in their back yards. The Children and Nature Network website <sup>2</sup> contains research that supports a growing list of health and educational benefits for children simply from being outdoors, especially when engaged in free and active play. According to numerous studies cited on this website, there is a direct connection between how much time children spend in nature and both their physical and mental health.

**4. The Department of Education should hire a full-time staff member for environmental education. This person should work to integrate environmental education into the curriculum.**

Environmental education is truly interdisciplinary. Therefore, since the



traditional curriculum is discipline-based, environmental education often falls through the cracks in our educational system and is neglected. Hiring an environmental education staff member in the Kentucky Department of Education would help insure that environmental education is taught consistently in the schools and that it supports the curriculum guidelines set by the Department of Education.

Over the next two years, there is an opportunity through the national No Child Left Inside Act <sup>3</sup> to seek federal funding for this position. Therefore, the Task Force strongly encourages the Kentucky Department of Education to work with KEEC to accomplish the goals that would secure that funding. These include the following:

- Relevant content standards, content areas, and courses or subjects where instruction will take place
- A description of the relationship of the plan to state graduation requirements
- A description of programs for professional development of teachers to improve their environmental content knowledge, skill in teaching about environmental issues, and field-based pedagogical skills
- A description of how the state educational agency will measure the environmental literacy of students
- A description of how the state educational agency will implement the plan, including securing funding and other necessary support

---

1 Promising Programs and Resources, National Environmental Education Foundation, 2002. Using Environment-Based Education to Advance Learning Skills and Character Development, North American Association for Environmental Education and National Environmental Education Foundation, 2001; Closing the Achievement Gap: Using the Environment as an Integrating Context for Learning, Lieberman and Hoody, 1997.

2 For more information go to: <http://www.childrenandnature.org/>

3 For more information go to: <http://www.cbf.org/Page.aspx?pid=687>



**5. The Kentucky Department of Education should collaborate with the EE community to insure that academic standards in a variety of disciplines, including math, science, social studies, economics, language arts and the humanities support content and skills that prepare students to address environmental issues they will face in both the immediate and long term future.**

The Task Force calls on the Department of Education to consciously and deliberately include environmental topics in subjects across the curriculum. Environmental content should be so ubiquitous in the standards that every student in the public school system receives regular instruction about the environment throughout his or her academic career. In addition, questions based on environmental knowledge should be included on the CATS test. Environmental education is the ideal interdisciplinary subject to help students synthesize content from the traditional disciplines, and this synthesis is the ideal vehicle to teach students such skills as problem solving and critical thinking. This knowledge and these skills will also prepare students to make their own informed environmental decisions.

**6. Kentucky schools and school districts should implement policies and programs that support a healthy learning environment as well as model appropriate environmental practices. Such policies and programs can teach by example and encourage behaviors that balance environmental protection with lifestyle choices. The Kentucky Green and Healthy Schools Program, recognized as one of the top six green curricula in 2008 by the U.S. Green Buildings Council, can provide an excellent starting point to implement such practices for both existing schools and for school design and construction.**

There is a large and growing body of research that indicates that such pressing health issues in children as obesity, asthma and ADHD can be improved by paying more attention to the environments in which children spend their time. According to the U.S. Green Buildings Council, Green schools

(usually called “High Performance Schools”) have better visual, aural and thermal comfort and much better indoor air quality. Children and teachers who spend time in these buildings have higher attendance rates. Such schools save significant amounts of money through energy and water efficiency as well. <sup>4</sup>

**7. Professional development opportunities should be provided that help teachers learn content and pedagogy related to environmental education. Such opportunities should make use of existing networks such as the Kentucky University Partnership for Environmental Education, the Kentucky Association for Environmental Education and other private and public organizations that provide professional development for teachers. These opportunities should also correlate to the professional development standards produced by the Department of Education and by local schools and school districts.**

While one of the primary goals for improving EE in Kentucky is to better prepare teachers before they graduate and are certified, continuing education for those already teaching is also important. In the rapid pace of our information age, the content and skills needed to teach environmental education change rapidly as well. Thus, it is important that teachers at all points in their careers have access to current and effective professional development in environmental education. It is perhaps even more important that professional development in EE should be provided for administrators so they can both see the value of EE as an instructional tool and be discerning in choosing quality programs in EE.



<sup>4</sup> For more information go to: [www.greenschools.ky.gov](http://www.greenschools.ky.gov) and <http://www.usgbc.org/DisplayPage.aspx?cmspageID=1718>



# The Role of Colleges and Universities in Preparing Educators and Future Leaders

All students who graduate from a Kentucky college or university should achieve a level of environmental literacy sufficient for them to understand how their own individual actions affect the environment and how the environment is affected by public policy decisions. As an excellent first step toward this, Kentucky's Education Professional Standards Board has begun working with colleges and universities to include environmental education content at both the undergraduate and graduate levels of teacher education. Currently, however, many college students in Kentucky, including those preparing to be teachers, still complete their four-year undergraduate degrees and even graduate work without ever achieving this basic level of environmental literacy. We believe the most effective way to address this issue is to support and maintain the existing Centers for Environmental Education at each state university.

The General Assembly mandated the creation of these centers in 1990 with KRS 157.915(3), which states that one of the functions of the Kentucky Environmental Education Council is to "establish and help coordinate the activities of regional environmental education centers and advisory committees at all state universities to serve as networks for the dissemination of environmental education programs, materials and information across the state." These centers will serve as catalysts to improve the way college and university students, elementary and secondary teachers and the public learn about the environment. While these centers are located on the campuses of the eight state universities, their roles are to provide leadership and technical assistance to all colleges and universities in Kentucky, including those in the Kentucky Community and Technical College System (KCTCS).

In the 2002 regular session, the General Assembly passed KRS 224.43-505, which

created a bond issue whose funds would be used to clean up abandoned landfills. The interest from that bond issue was directed to the KEEC to "implement the environmental education center component of the Environmental Education Master Plan". In January 2004, monies began accumulating in this fund. However, now that these principal funds are largely expended, the interest is no longer sufficient to fund the centers. Therefore, efforts should be continued to adequately and permanently support the efforts of higher education to improve the preparation of future leaders in the Commonwealth to address environmental issues.

The next three recommendations describe the goals this plan sets out for environmental education at the postsecondary level.

## **8. Funding should be made available to the eight state universities to improve environmental education within the university curriculum with the following provisions.**

- **The centers for environmental education currently operating at the eight state universities should either be placed within the College of Education at their respective universities or otherwise be able to demonstrate a close working relationship with those colleges.**
- **Each center should convene a faculty advisory board whose members represent a variety of disciplines in the natural and social sciences and education to insure that environmental content is included in those courses required for all students.**
- **Funds should be used for the implementation of recommendations nine and ten of this 2009 plan or such other programs as the gubernatorially appointed members of the Kentucky Environmental Education Council shall deem appropriate.**

- **The universities should measure how successful they are at implementing recommendations nine and ten and report those findings annually to the General Assembly.**

In a system as large and traditional as a university, change is often slow. Therefore, having a change agent on campus to help in efforts to improve the environmental literacy of all graduates is highly desirable if not necessary. In the case of environmental education, which is interdisciplinary as well as highly complex, the expertise of the Centers for Environmental Education would be a valuable resource as the universities move toward a curriculum that both teaches and models sustainability.

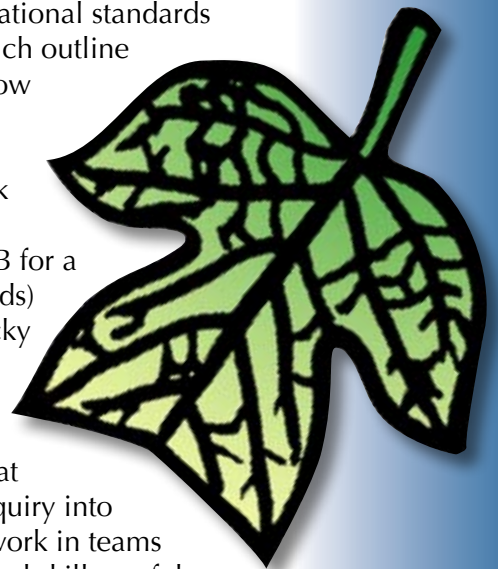
**9. Colleges and universities in Kentucky, including those in the Kentucky Community and Technical College System, should make education about the environment and sustainability an integral part of general education requirements. Collaborative interdisciplinary courses, based on standards from the North American Association for Environmental Education, need to be developed. These courses should link ecology and other natural sciences, social sciences, the humanities, and teacher education.**

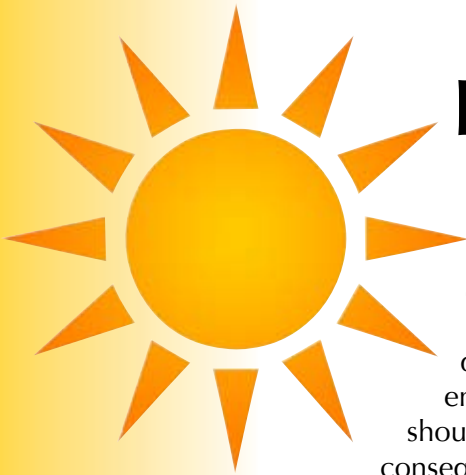
Today's leaders and certainly the leaders of tomorrow must be able to build more sustainable lives and communities. Our colleges and universities are the primary proving ground and springboard for our future leaders. Therefore it falls to higher education to both teach the subject matter that helps graduates understand environmental issues and to integrate that knowledge in such a way that future leaders can solve pressing environmental problems.

**10. Kentucky teachers must be better prepared to teach about the environment before they receive initial certification. This preparation requires significantly higher levels of environmental literacy and demonstrated competency in environmental education instructional methods. To accomplish this, the Task Force requests that the Kentucky Education and Professional Standards Board reinstate environmental**

**education as a theme in the preservice curriculum.**

Two things need to happen if Kentucky's teachers are to be better prepared to teach about the environment. First, they must have a stronger background in the subjects that are the basis of environmental education, including, but not limited to, ecology. Second, they must know the most effective instructional techniques for presenting that knowledge to students. National standards have been developed which outline what teachers need to know and be able to do to be effective environmental educators and coursework should be based on these standards. (see appendix B for a summary of those standards) Classrooms across Kentucky operate differently than they did twenty years ago. Now, instruction involves using projects that relate interdisciplinary inquiry into content study. Students work in teams to gain both knowledge and skills useful in real-world settings. National research shows there simply is not a better vehicle for providing these kinds of experiences than environmental education (see footnote <sup>2</sup> on page 7). Teacher education students who experience this kind of learning themselves will be much more successful applying it to their own classrooms, a gain both to environmental education and to education in general. Therefore, this recommendation also encourages colleges of education to offer environmental education courses that model these techniques, including the frequent use of outdoor settings for instruction.





# Reaching Kentucky's Adults

While it is essential that young people become environmentally literate, it is adults who make the lifestyle decisions that affect Kentucky's environment. Therefore, adults should know the environmental consequences of their personal actions, as well as how environmental policies affect them. In order to gain this understanding, adults should know such basic ecological concepts as watersheds, ecosystems, biodiversity and energy transfer, among many others. This section of the master plan focuses on improving the environmental literacy of the general adult population; beginning with a survey of the current state of adult environmental education in Kentucky and including a recommendation to create a media campaign to help Kentucky citizens better understand the importance to their own lives of being environmentally knowledgeable. Additionally, the Master Plan Task Force strongly advises that recommendations thirteen and fourteen (in the next section of this report) be applied to programs for adults as well.

**11. Beginning with those agencies on the EEinKentucky website <sup>5</sup>, the Kentucky Environmental Education Council should conduct an inventory of current, planned, and active environmental education programs that provide adult and family education. The survey will look at the environmental topics and types of education offered by each provider and the numbers of people served annually. Also included will be a needs assessment of providers, along with a survey of best practices and success stories.**

Currently, no one knows how many programs offer environmental education opportunities to adults and families in Kentucky. Nor do we know what topics are covered and where gaps and duplications may exist. This survey would help policy makers and EE professionals both plan new programs and better understand the needs of existing programs. In addition, real success stories could highlight best practices and help us recreate those successes.

**12. In partnership with other organizations that offer EE to adult audiences, KEEC should develop a social marketing effort to raise the importance of EE in the public arena. Such a campaign would use social, print and broadcast media to convey the message that understanding environmental issues is important to both our health and economy.**

As budgets tighten, policy makers must make difficult decisions about which programs to fund or to cut. These decisions are based both on practicalities and on what voters value most. While studies show that environmental education is important to the majority of Americans (and Kentuckians), it does not rank high on priority lists that include health care, jobs, national security, etc. Yet environmental issues are intricately tied to all these other issues. This media campaign would help Kentuckians (and their representatives) better comprehend how understanding the interrelationships between human and natural systems can improve life for all of us. KEEC would lead the effort to raise private funding for this campaign.

---

<sup>5</sup> For more information please see <http://EEinKentucky.org>

# Creating an Efficient and Exemplary System

The goal of the recommendations in this section is to create a more effective and efficient system of environmental education in the Commonwealth. Great strides have been made since the printing of the first Land, Legacy and Learning document ten years ago. Many more organizations now offer environmental education, and that education is more likely to be standards-based. Well over 100 non-formal environmental educators have completed a rigorous certification program, and dozens of teachers have received the EE Endorsement. The recommendations in this section attempt to build on those advances and improve the quality of EE programming statewide. Further, the recommendations in this section focus on using both new and proven communication techniques to reach audiences more directly.

**13. KEEC and KAEE should create and offer a training program to help environmental education agencies and organizations in Kentucky build stronger, more effective programs for adults and families. The training should be offered each year at the KAEE conference, as well as in other venues. Training content should be based on the National Guidelines for Excellence in Non-formal Environmental Education Programs (created and published by the North American Association for Environmental Education) as well as specific areas cited in the needs assessment described in recommendation 11. EE providers completing this training should be listed on a special area of the EEinKentucky website.**

Along with well-established programs, new environmental education programs are appearing around the state to meet the increasing interest in all things green. However, no guidance is available to help environmental education organizations develop new programs to meet the needs of all Kentuckians. This recommendation calls for the development of a training course based on a needs survey and on the national standards for what constitutes an exemplary

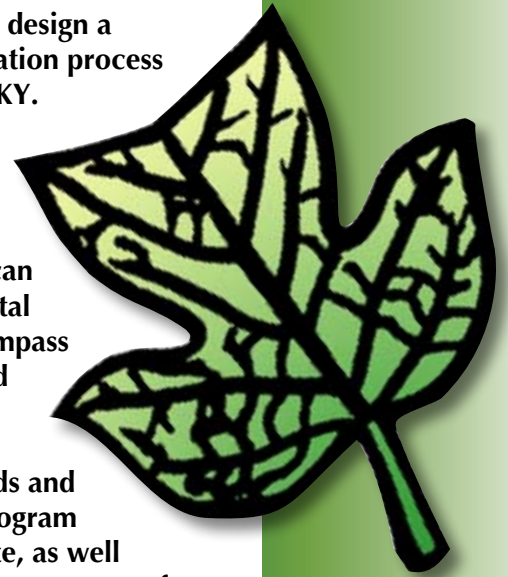
program. Such training would be offered annually at the KAEE conference and in at least one other venue. (See appendix C and D for a summary of these national standards.)

**14. KAEE and KEEC should design a voluntary review and evaluation process for existing EE programs in KY. These reviews would be based on the national standards for exemplary programs (see appendix C) developed by North American Association for Environmental Education and should encompass design, implementation, and delivery strategies for such programs. They would also include curriculum standards and correlations to Kentucky Program of Studies where appropriate, as well as consideration of the unique aspects of environmental education in Kentucky.**

Evaluation of all EE programming is a weak spot in environmental education in the Commonwealth. This recommendation would formalize a process of review based on national standards already in place for such assessments. Since the process is so time consuming, KAEE and KEEC would need to charge appropriate fees to those organizations which seek this service. The Kentucky University Partnership for Environmental Education would be a natural partner in this process.

**15. Environmental education providers should increasingly use social networking media to reach young people with information about environmental topics.**

Many environmental education organizations (including KEEC and KAEE) already use social networking media. However, as these media shift with the ebb and flow of information exchange, it is important that all those who offer environmental education be aware of the





opportunities provided by such user-friendly venues.

**16. KEEC should explore all avenues, traditional and non-traditional, for creating partnership/networking opportunities, with the ultimate goal being the expansion of knowledge about Kentucky's environment.**

Members of the environmental education community in Kentucky, including the

Kentucky Environmental Education Council, the Kentucky Association for Environmental Education, and others, should continue to make concerted efforts to include those who have not traditionally been part of the network but who now offer significant contributions to environmental education. These would include such entities as health educators, community and city planners, faith-based organizations, and directors of service learning programs, among others.

# KENTUCKY ENVIRONMENTAL EDUCATION COUNCIL

## Council Members

W. Horace Brown, Chair  
Allen Branscum  
Tom FitzGerald  
James D. Funk  
Charles Gregory Higdon  
Cheryl Lynn Messenger  
Evelyn Morgan  
Marcus Norton  
Robert Roquemore

## Staff Members

Jane Eller  
Michelle Nevels  
Merin Roseman

## Task Force Members

Joe Baust  
Billy Bennett  
Ashley Chatham  
Lee Colten  
Marcelle Geanelloni  
April Haight  
Jenny Howard  
Danielle Hutchins  
Beth Inman  
Jennifer Lynn  
Elizabeth McNulty  
Peggy Nims  
Amanda Patrick  
Teddie Phillipson-Mower  
Elizabeth Robb  
Merin Roseman  
Maxine Rudder  
Nathan Rudder  
Kate Shanks  
Amy Sonyer  
Debra Sprillman  
Teresa Spurling  
Melinda Wilder  
Ernie Yanarella

# Appendix A: Outline of NAAEE Guidelines for Learners K-12

## Strand 1- Questioning, Analysis and Interpretation Skills

- Questioning
- Designing Investigations
- Collecting information
- Evaluating accuracy and reliability
- Organizing information
- Working with models and simulations
- Drawing conclusions and developing explanations

## Strand 2- Knowledge of Environmental Processes and Systems

### 2.1 The earth as a physical system

- Processes that shape the earth
- Changes in matter
- Energy

### 2.2 The living environment

- Organisms, populations, and communities
- Heredity and evolution
- Systems and connections
- Flow of matter and energy

### 2.3 Humans and their societies

- Individuals and groups
- Culture
- Political and economic systems
- Global connections
- Change and conflict

### 2.4 Environment and society

- Human/environment interactions
- Places
- Resources
- Technology
- Environmental Issues

## Strand 3- Skills for Understanding and Addressing Environmental Issues

### 3.1 Skills for analyzing and investigating environmental issues

- Identifying and investigating issues
- Sorting out the consequences of issues
- Identifying and evaluating alternative solutions and courses of action
- Working with flexibility, creativity, and openness

### 3.2 Decision-making and citizenship skills

- Forming and evaluating personal views
- Evaluating the need for citizen action
- Planning and taking action
- Evaluating the results of actions

## Strand 4- Personal and Civic Responsibility

- Understanding societal values and principles
- Recognizing citizens' rights and responsibilities
- Recognizing efficacy
- Accepting personal responsibility

# Appendix B: Outline of NAAEE Guidelines for the Preparation of Environmental Educators

**#1—Environmental Literacy: Educators must be competent in the skills and understandings outlined in Excellence in Environmental Education—Guidelines for Learning (Pre K–12).**

- 1.1 Questioning, analysis, and interpretation skills
- 1.2 Knowledge of environmental processes and systems
- 1.3 Skills for understanding and addressing environmental issues
- 1.4 Personal and civic responsibility

**#2—Foundations of Environmental Education: Educators must have a basic understanding of the goals, theory, practice, and history of the field of environmental education.**

- 2.1 Fundamental characteristics and goals of environmental education
- 2.2 How environmental education is implemented
- 2.3 The evolution of the field

**#3—Professional Responsibilities of the Environmental Educator: Educators must understand and accept the responsibilities associated with practicing environmental education.**

- 3.1 Exemplary environmental education practice
- 3.2 Emphasis on education, not advocacy
- 3.3 Ongoing learning and professional development

**#4—Planning and Implementing Environmental Education: Educators must combine the fundamentals of high-quality education with the unique features of environmental education to design and implement effective instruction.**

- 4.1 Knowledge of learners
- 4.2 Knowledge of instructional methodologies
- 4.3 Planning for instruction
- 4.4 Knowledge of environmental education materials and resources
- 4.5 Technologies that assist learning
- 4.6 Settings for instruction
- 4.7 Curriculum planning

**#5—Fostering Learning: Educators must enable learners to engage in open inquiry and investigation, especially when considering environmental issues that are controversial and require students to seriously reflect on their own and others' perspectives.**

- 5.1 A climate for learning about and exploring the environment
- 5.2 An inclusive and collaborative learning environment
- 5.3 Flexible and responsive instruction

**#6—Assessment and Evaluation: Environmental educators must possess the knowledge, abilities, and commitment to make assessment and evaluation integral to instruction and programs.**

- 6.1 Learner outcomes
- 6.2 Assessment that is part of instruction
- 6.3 Improving instruction
- 6.4 Evaluating programs



# Appendix C: Outline for the NAAEE Guidelines for Excellence in Nonformal Environmental Education Programs

**Key Characteristic #1 – Needs Assessment.** Nonformal environmental education programs are designed to address identified environmental, educational, and community needs and to produce responsive, responsible benefits that address those identified needs.

- 1.1 Environmental issue or condition;
- 1.2 Inventory of existing programs and materials; and
- 1.3 Audience needs.

**Key Characteristic #2 – Organizational Needs and Capacities.** Nonformal environmental education programs support and complement their parent organization’s mission, purpose, and goals.

- 2.1 Consistent with organizational priorities;
- 2.2 Organization’s need for the program identified; and
- 2.3 Organization’s existing resources inventoried.

**Key Characteristic #3 – Program Scope and Structure.** Nonformal environmental education programs should be designed with well-articulated goals and objectives that state how the program will contribute to the development of environmental literacy.

- 3.1 Goals and objectives for the program;
- 3.2 Fit with goals and objectives of environmental education;
- 3.3 Program format and delivery; and
- 3.4 Partnerships and collaboration.

**Key Characteristic #4 – Program Delivery Resources.** Nonformal environmental education programs require careful planning to ensure that well-trained staff, facilities, and support materials are available to accomplish program goals and objectives.

- 4.1 Assessment of resource needs;
- 4.2 Quality instructional staff;
- 4.3 Facilities management;
- 4.4 Provision of support materials; and
- 4.5 Emergency planning.

**Key Characteristic #5 – Program Quality and Appropriateness.** Nonformal environmental education programs are built on a foundation of quality instructional materials and thorough planning.

- 5.1 Quality instructional materials and techniques;
- 5.2 Field testing;
- 5.3 Promotion, marketing, and dissemination; and
- 5.4 Sustainability.

**Key Characteristic #6 – Evaluation.** Nonformal environmental education programs define and measure results in order to improve current programs, ensure accountability, and maximize the effects of future efforts.

- 6.1 Determination of evaluation strategies;
- 6.2 Effective evaluation techniques and criteria; and
- 6.3 Use of evaluation results.

# Appendix D: Outline for NAAEE Guidelines for Excellence in Environmental Education Materials

**#1 Fairness and accuracy: EE materials should be fair and accurate in describing environmental problems, issues, and conditions, and in reflecting the diversity of perspectives on them.**

- 1.1 Factual accuracy
- 1.2 Balanced presentation of differing viewpoints and theories.
- 1.3 Openness to inquiry
- 1.4 Reflection of diversity

**#2 Depth: EE materials should foster awareness of the natural and built environment, an understanding of environmental concepts, conditions, and issues, and an awareness of the feelings, values, attitudes, and perceptions at the heart of environmental issues, as appropriate for different developmental levels.**

- 2.1 Awareness
- 2.2 Focus on concepts
- 2.3 Concepts in context
- 2.4 Attention to different scales

**#3 Emphasis on skills building: EE materials should build lifelong skills that enable learners to address environmental issues.**

- 3.1 Critical and creative thinking
- 3.2 Applying skills to issues
- 3.3 Action skills

**#4 Action orientation: EE materials should promote civic responsibility, encouraging learners to use their knowledge, personal skills, and assessments of environmental problems and issues as a basis for environmental problem solving and action.**

- 4.1 Sense of personal stake and responsibility
- 4.2 Self-efficacy

**#5 Instructional soundness: EE materials should rely on instructional techniques that create an effective learning environment.**

- 5.1 Learner-centered instruction
- 5.2 Different ways of learning
- 5.3 Connection to learners' everyday lives
- 5.4 Expanded learning environment
- 5.5 Interdisciplinary
- 5.6 Goals and objectives
- 5.7 Appropriateness for specific learning settings
- 5.8 Assessment

**#6 Usability: EE materials should be well designed and easy to use.**

- 6.1 Clarity and logic
- 6.2 Easy to use
- 6.3 Long-lived
- 6.4 Adaptable
- 6.5 Accompanied by instruction and support
- 6.6 Make substantiated claims
- 6.7 Fit with national, state, or local requirements

# The 2009 Survey of Kentuckians' Environmental Knowledge, Attitudes and Behaviors

Survey Conducted  
By  
**The Kentucky Environmental Education Council**  
And  
**The University of Kentucky Survey Research Center**

**Released, September, 2009**

In 1995, the Kentucky Environmental Education Council (KEEC), a state agency, was established to improve environmental education in the Commonwealth. The General Assembly charged the agency with a number of tasks, one of which was to “monitor and report periodically on environmental literacy in Kentucky.” KEEC, working with the University of Kentucky Survey Research Center, completed the first survey of environmental knowledge, attitudes and behaviors in 1999 and the second in 2004. This report gives the results of the 2009 survey and compares it to the previous surveys.

As in the first two reports, this survey does not actually measure the environmental literacy of Kentuckians. Environmental literacy is so complex that it is difficult to define, let alone to measure. This survey, conducted by the UK Survey Research Center on a random sample of 634 Kentucky adults in the spring of 2009, is simply a snapshot of whether Kentuckians can answer some very basic questions about issues that deal with air, land and water quality. It also asks Kentuckians to share their attitudes about certain environmental issues, such as how well we are protecting our natural resources. Finally, it asks Kentuckians to identify whether or not they engage in behaviors that might improve their environment.

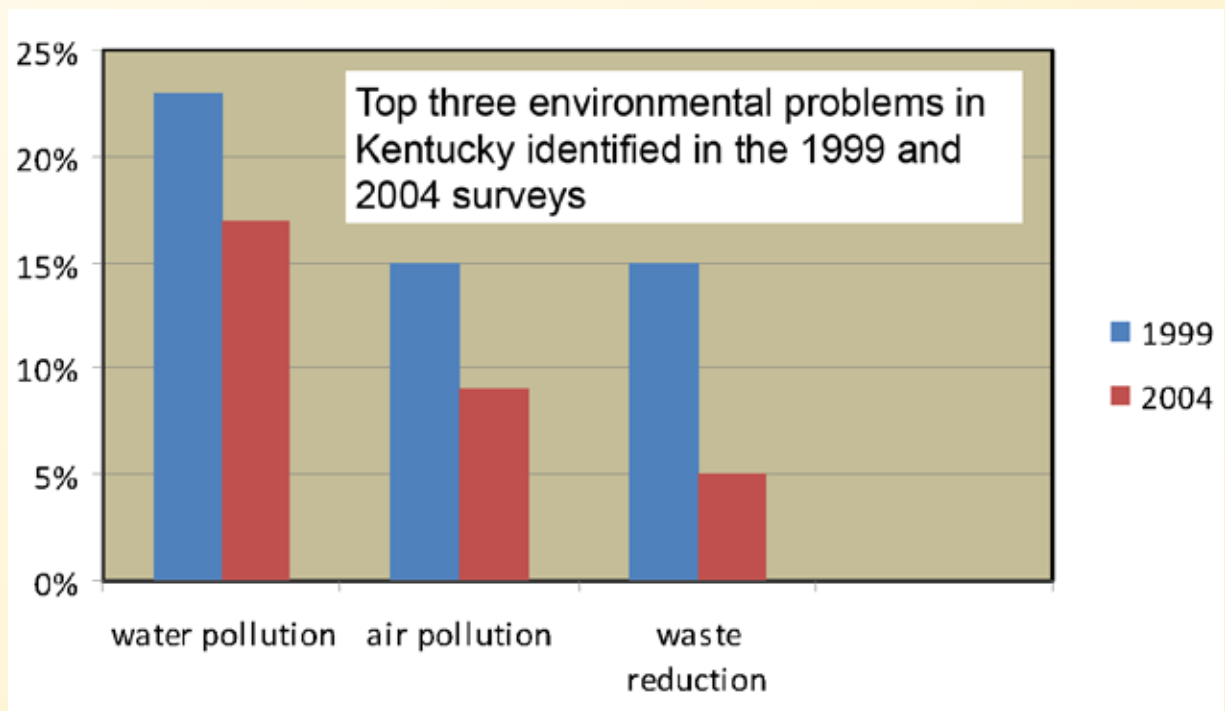
The first three sections of this document report on the knowledge, attitudes and self-reported behaviors of Kentuckians in general regarding the environment. The final section breaks down some of those questions by socioeconomic group. Please note that all percentages have been rounded to the nearest whole number for easier reading and that there is a margin of error of 4% at a 95% confidence level.

# Results of the Survey

## KNOWLEDGE

The survey asked questions that measured Kentuckians' knowledge of current environmental topics. The questions were designed to be very easy. These are questions that any middle school student should be able to answer and, as expected, the majority of respondents to the survey were able to answer many, though not all, questions correctly. However, a very significant minority – in many cases nearly half – of respondents were not able to give correct answers to some of these very basic questions.

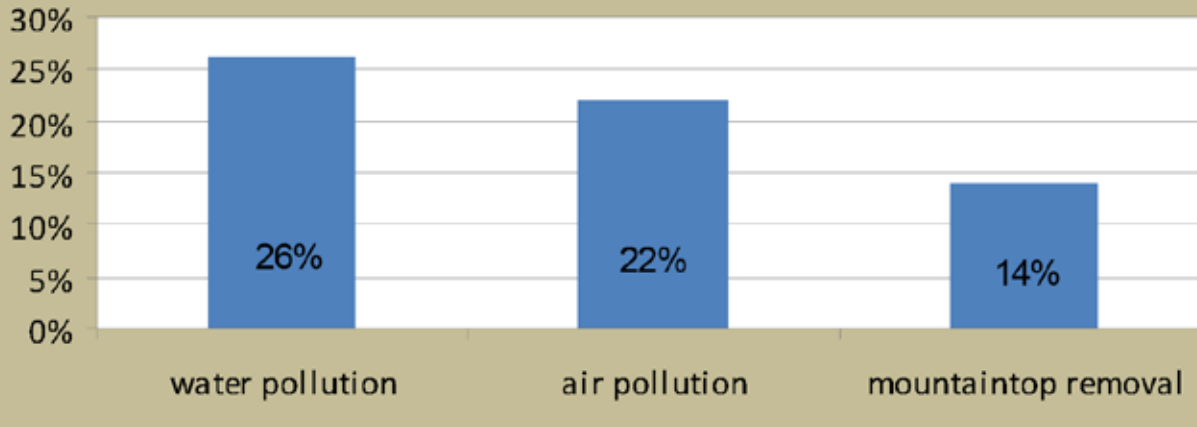
In 1999 and 2004, when asked to cite the most important environmental problem in Kentucky, most respondents simply identified “pollution”: not citing a specific problem or issue. In this year's survey, the percentage of respondents giving this general answer fell to only 5%, perhaps indicating a greater awareness of more specific environmental issues.



Among those who gave specific responses in 1999 and 2004, water pollution was named most often as the leading environmental problem in the Commonwealth. Water was also number one in the 2009 survey, coming in at 26% in the rankings for topics of most concern, as compared to 24% in 1999 and 17% in 2004. Though air pollution was ranked second in all three surveys, the number of people identifying air pollution as the number one problem rose rather dramatically from 9% in 2004 to 22% in 2009.

The most interesting finding for this question in the 2009 survey was that Kentuckians ranked mountaintop removal as third in environmental problems of most concern in the Commonwealth. This issue did not make it into the top rankings in either 1999 or 2004. However, in the latest survey, 14 % of respondents named it as the most important environmental problem facing the Commonwealth perhaps reflecting increased interest in energy and environmental issues or in increased publicity around the subject. Another surprising finding in the 2009 survey, is that global warming, despite the media attention it has gotten in recent years, was ranked as the most important environmental problem in Kentucky by only 1% of respondents.

## Top three environmental problems in Kentucky identified in the 2009 survey

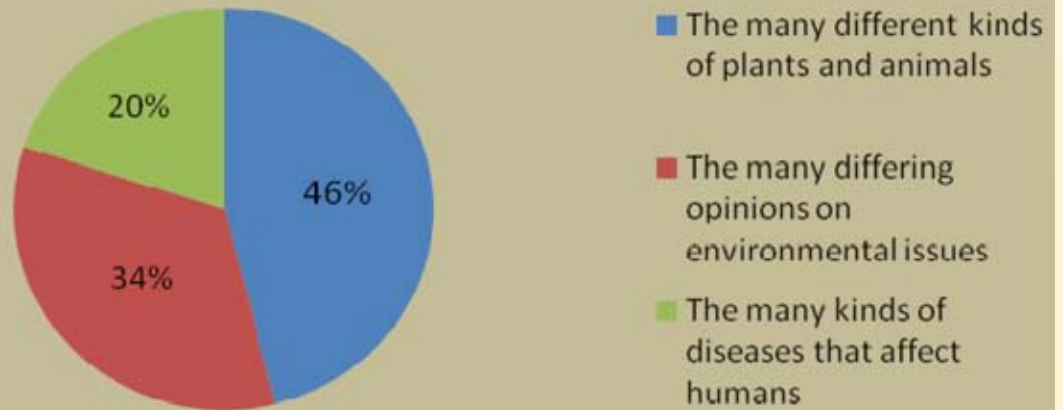


Though water pollution is identified as the leading environmental problem by those surveyed (mirroring national and worldwide surveys), the majority of Kentuckians are still unable to correctly identify runoff from fields, pavements and lawns as the leading source of water pollution in the Commonwealth. However, the number of respondents who do answer correctly has risen from 17% in 2004 to 28% in this year's survey; a significant improvement. In 2004, a whopping 56% incorrectly identified factory waste as the leading source of water pollution. Although that number has fallen to 49% in the 2009 survey, it still indicates a tenacious stereotype that is difficult to overcome.

When asked in 1999 and 2004 the major source of electricity generation in the U.S., only 49% of Kentuckians, less than half, correctly identified coal-burning power plants. This year, 60% answered this question correctly, indicating a jump in citizen knowledge of this issue. Most of the remainder, 37%, continues to identify nuclear or hydroelectric generation as the major sources, even though these sources generate less than 4% of Kentucky's electricity ([www.eia.doe.gov](http://www.eia.doe.gov)). While this is an improvement, these percentages are still of concern in a state where electricity costs are relatively low due to our proximity to coal and where coal, the jobs it creates, and the way it is mined are major sources of public debate.

When asked to choose a best definition for biodiversity, 46% of those surveyed in 2009 correctly chose the answer, "the many different kinds of plants and animals." This was down from 55% in 2004. In addition, as in 2004, a large minority, 34% in 2009 and 31% in 2004, incorrectly identified the definition of biodiversity as "the many differing opinions on environmental issues". In a related question that asked the most common reason for the extinction of animals and plants, "habitat loss" was correctly identified by 60% of respondents. This was almost exactly the same percentages as those in the 1999 and 2004 surveys. Kentuckians were better able to identify the primary benefit of wetlands in the 2009 survey than in the 2004 survey. Only 63% said that wetlands help to clean natural water systems in 2004. This year, 68% answered this question correctly.

## 2009 survey answers to the question, "What is the best definition of biodiversity?"



Only a little more than half of those surveyed in 2004 correctly answered a very basic question defining renewable resources. In the 2004 survey, only 55% correctly answered that solar energy and trees are renewable resources. In the 2009 survey, 67% correctly identified solar energy and trees as renewable. This is a notable improvement. However this means that a full 30% of Kentuckians still believe that coal, oil, iron and other metals are renewable resources.

On a question concerning hazardous waste, respondents did fairly well. When asked to identify which of the following: paints, acids and pesticides; glass and newspapers; or building materials such as lumber and nails were considered hazardous waste, 91% of those surveyed correctly identified paints, acids and pesticides. This is up from 86% in 2004. Kentuckians' knowledge of where garbage eventually ends up (the correct answer is landfills) continues to remain fairly high at 78%, compared to 77% in both 1999 and 2004. In 2009, 14% incorrectly identified illegal dumps as the leading destination for household garbage. This is the same percentage as in 2004 but an improvement over the 1999 findings of 23%.

Two new knowledge questions were added to the 2009 survey. The first asked, "Does all rainwater that runs off lawns, roads and fields go into a treatment plant?" Eighty-six percent of those surveyed correctly answered "no" to this question. This is an interesting response in a state where pollutants in runoff and stormwater are major problems. It means that people understand that whatever is put onto fields, lawns and roads goes untreated into our waterways but perhaps have not made the next logical step that links that runoff pollution to their own everyday actions.

In the second new question, those surveyed were asked to compare the relative contributions of motor vehicles, factories and "the breath from people and animals" in adding carbon dioxide to the atmosphere. (Carbon dioxide is among the greenhouse gases implicated in global climate change.) Fifty-seven percent correctly identified emissions from motor vehicles as the highest contributor from among these three. Eight percent identified "the breath from people and animals" as the largest contributor.

## ATTITUDES

Other questions on the survey asked Kentuckians to give their opinions on various environmental topics. In 1999, Kentuckians surveyed tended to believe that air and water quality in the areas where they lived was better than air and water quality in general. These beliefs held true in the 2004 and again in 2009, though the percentages changed somewhat. For example, when asked to rate the environmental quality of water in the U.S., 45% in the 2009 survey reported that water quality was excellent or good. This compares with 40% in the 1999 survey and 50% in the 2004 survey. However, when asked to rate the environmental quality of water in their own area, 60% rated water quality as excellent or good, down from 62% in 1999 but up from 56% in 2004.

When asked to rate air quality in the U.S., 34% rated it excellent or good compared to 41% in 2004 and 44% in 1999. However, as with water quality, Kentuckians rated air quality in their own area as much better. In the 2009 survey, those Kentuckians surveyed who rated air quality in their own area as either excellent or good was 58% compared to 64% in 2004 and only 52% in 1999.

When asked if specific areas of the environment are adequately protected, there was a slight decrease between 2004 and 2009 in the percentage of Kentuckians who agree that there is adequate protection. For example, when asked if wild and natural areas are adequately protected, 67% agreed that they are adequately protected, compared to 72% in the 2004 survey and 69% in the 1999 survey.

Sixty-two percent of those surveyed in 2009, either agreed or somewhat agreed that wetlands are adequately protected. This is exactly the same percentage as in 2004 and slightly more than the 57% in 1999. Finally, 64% of those surveyed in 2009 agreed that endangered species are adequately protected compared to 70% in 2004 and 63% of those in the 1999 survey.

In perhaps the most controversial question of the survey, respondents were asked to agree or disagree with the following statement: "Private landowners should be able to use their land in any way they see fit." As in the previous two surveys, the percentage of those who agreed and those who disagreed with this statement are very close, though there was a slight increase in the percentage that agreed with this statement. In the 2009 survey, 54% of Kentuckians surveyed agreed with this statement, while 46% disagreed. In 2004, 51% of Kentuckians agreed with this statement while 49% disagreed. In 1999, 52% agreed and 48% disagreed.

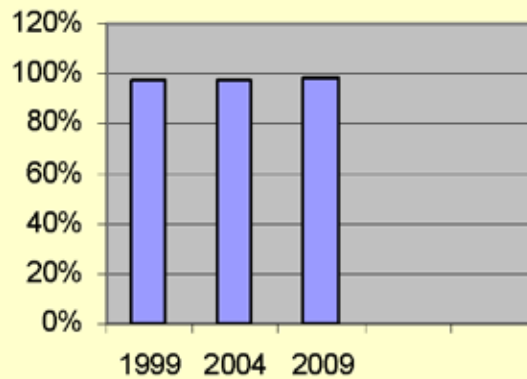
In a question first asked on the 2004 survey, Kentuckians were asked to agree or disagree with this statement: "It is possible to both protect the environment and have a strong economy." In 2004, 92% of respondents either strongly agreed or somewhat agreed with this statement. Remarkably, in the 2009 statement, even more respondents agreed. In this latest survey, 96% of respondents either strongly agreed or somewhat agreed with this statement. For years, the "conventional" wisdom has been the opposite so Kentuckians are obviously ahead of the curve on this issue.

Those surveyed were asked to agree or disagree with the statement: environmental education should be taught in the schools." In the 2009 survey, 98% agreed with this statement, which is just one percentage point off from those who agreed with this statement in both the other surveys. This number is almost exactly the same, as well, for national surveys on this topic ([www.neefusa.org](http://www.neefusa.org)). In many states such as Pennsylvania, Wisconsin, and California, the high percentages of citizens agreeing that environmental education should be taught in the schools, coupled with increasingly high costs for cleaning up environmental problems that could have been prevented in the first place, have led to officially sanctioned public school curricula dedicated to environmental education.

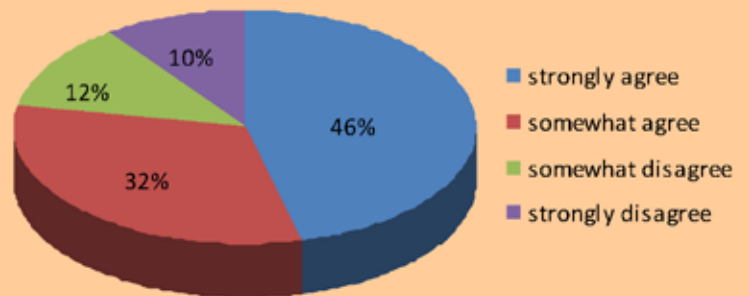
Three new questions appeared on the survey of environmental attitudes this year. The first was about global climate change. Respondents were asked if they agreed or disagreed with the statement, "Human activity is causing global climate change." Seventy-six percent of those surveyed either strongly agreed or somewhat agreed with this statement.

In a related question, respondents were asked which of three strategies was the best for addressing the energy crises. Fifty-four percent identified "developing alternative energy such as solar or wind power", as the most important strategy; twenty-three percent answered "developing technology that would make the mining and burning of coal better for the environment"; and another 23% answered that the choice "education and conservation incentives", was the best way to address the energy crises. In the third new question, Kentuckians were asked if they agreed that the day-to-day actions of all of us are a major contributor to pollution, 92% agreed with this statement.

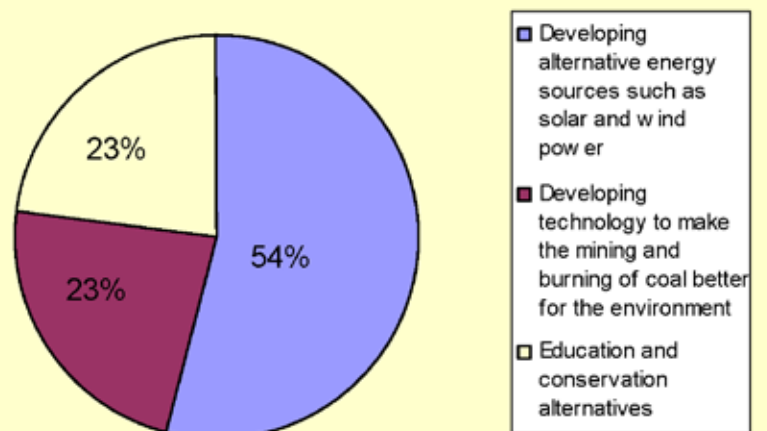
Percentage of those surveyed who believed environmental education should be taught in the schools



Percentage of Kentuckians who agree or disagree that global climate change is human caused



Answer to the question, "What is the best strategy for addressing the energy crises?"





## **BEHAVIORS**

The final section of the survey concerned self-reported behaviors that protect the environment. Respondents were asked to report behaviors or beliefs that would have a positive effect on the environment. Although readers should be aware that positive behaviors are often over reported, Kentuckians surveyed (in both 2004 and 1999) do report a strong interest in knowing about and protecting the environment. For example, in all three surveys, 95% agree that knowing about environmental problems is important to them. This is the same percentage as in 1999. In the 2009 survey, 66% of those surveyed reported donating time or money to environmental causes, either frequently or sometimes, up slightly from 60% in 2004 and about the same as in 1999.

In 1999, 84% of Kentuckians said gas mileage is either frequently or sometimes an important consideration when they buy a car. This figure was 85% in 2004. In the 2009 survey, after gas prices spiked in 2008, 95% of Kentuckians report looking for cars that get better gas mileage.

Waste reduction is one of the most widely recognized ways to protect the environment and, on questions related to this issue, a fairly large number reported engaging in these behaviors. Ninety-two percent of those surveyed in 2009 reported that they attempt frequently or sometimes to reduce the amount of waste produced in their household. This compares to 93% in both 2004 and 1999. Similarly, in 2009, 80% of those surveyed reported buying products with less packaging, compared to 83% in 2004 and 84% in 1999.

Money talks and one of the questions on the survey asked respondents to answer yes or no regarding whether or not they would be willing to pay more for goods and services in order to protect the environment. The number of those who answered yes dropped from the 1999 survey, moving from 74% in 1999 to 63% in 2004 to 61% in the 2009 survey.

In a new question asked this year, those surveyed were asked how often they bought locally grown foods and other products. Ninety-six percent of those surveyed answered that they did so frequently or sometimes.

### **Differences in General Environmental Knowledge Based on Socio-Economic Factors**

Along with the knowledge, attitude and behavior questions, those surveyed were asked to report such information as their age, education level, gender, in what type of community they lived, and how long they had lived in the Commonwealth. For some questions on the survey there were statistically significant differences in the way these socioeconomic factors affected answers to the questions. In contrast to the two previous surveys, the 2009 data reported a general knowledge score among those surveyed.

In several socioeconomic categories, there were significant differences with respect to the level of general environmental knowledge. For example, the general environmental knowledge level of women was lower than that of men and (as would be expected) the higher the level of educational attainment, the higher the general knowledge level. Additionally, the higher the household income level, the better respondents did on the knowledge section of the survey. Since income often correlates with education level, this too is not surprising.

Such indicators as community type, age, and how long a person had lived in Kentucky did not seem to affect their ability to correctly answer the knowledge questions, one way or another.

### **Gender Differences in Attitudes and Behaviors**

Within socio economic groups, those with higher incomes and levels of education generally reported more environmentally favorable attitudes and behaviors.

Gender differences were also apparent in attitudes and reported behaviors. For example, women rated air and water quality in their own areas lower than did men in the survey. Women were also less likely to believe that wild areas are adequately protected. Women in the survey were more likely than men to believe that global climate change was human caused and that the day-to-day actions of all of us are a major source of pollution.

In reported behaviors, women were more likely than men to report that gas mileage was a major consideration when buying a car and also more likely to buy products with less packaging and to reduce household waste.



Published by



# Kentucky Environmental Education Council

800-882-5271  
[www.keec.ky.gov](http://www.keec.ky.gov)

Printed with state funds on recycled paper with soy-based ink  
An Equal Opportunity Employer M/F/D