Environmental Education in Wisconsin

Are we walking the talk?

A Profile of Environmental Education in Wisconsin K-12 Schools Based on Statewide Surveys and Assessments of Students, Teachers, Curriculum Coordinators, and Principals

Funding and Support Provided by

Wisconsin Environmental Education Board
Wisconsin Department of Public Instruction
Wisconsin Center for Environmental Education
University of Wisconsin-Stevens Point College of Natural Resources
University of Wisconsin Cooperative Extension

Environmental Education in Wisconsin

Are we walking the talk?

Substantial support for the development of this report and the research it is based upon was provided by the Wisconsin Environmental Education Board (WEEB)

For further information or to obtain copies of this report contact:

Wisconsin Center for Environmental Education
403 Learning Resources Center
University of Wisconsin-Stevens Point
Stevens Point, WI 54481

Phone: (715) 346-4950
Fax: (715) 346-3025
Email: wcee@uwsp.edu
WWW: http://www.uwsp.edu/acad/wcee

Acknowledgments

Many, many thanks are owed to all the people who have contributed to this project over the years. Besides the people listed on this and the next three pages, there were literally hundreds of teachers and administrators who willingly gave their time and expertise to make the studies this report is based upon possible. Unfortunately, space doesn't allow mention of every one of their names. Thank you all!

Research Coordinator and Report Author

Randy Champeau, Ph.D.
Professor of Resource Management, University of Wisconsin-Stevens Point
Director, Wisconsin Center for Environmental Education (WCEE)

Research Analysis, Report Production and Distribution

Phyllis Peri, M.S., Environmental Education Resource/Network Coordinator, WCEE

Report Design

Jeffrey W. Morin, sailorBOYpress, Stevens Point, WI

Draft Production

Carol Wake, WCEE Office Management

Contributing Authors and Researchers

Jennie Lane, M.S.
Coordinator of Curriculum Development, Wisconsin K-12 Energy Education Project, WCEE

Phyllis Peri, M.S.
Environmental Education Resource/Network Coordinator, WCEE

Anna Quale, M.S.
Middle School Teacher
Walker Middle School, Sturgeon Bay

Cathrine Rossow-Cunningham, M.S.
Environmental Education Specialist
Urbana, Illinois

Dan Sivek, Ph.D.
Associate Professor of Resource Management, University of Wisconsin-Stevens Point
Secondary Education Specialist, WCEE

Dennis Yockers, Ph.D.
Associate Professor of Resource Management, University of Wisconsin-Stevens Point
Elementary/Middle School Specialist, WCEE

Student and Teacher Assessment Advisory Council

Russ Allen, Ph.D., Research Consultant
Wisconsin Education Association Council
Madison

Dr. Randy Champeau, Director
Wisconsin Center for Environmental Education
College of Natural Resources
University of Wisconsin-Stevens Point

Dr. Claude Deck, District Administrator, retired
Onalaska Schools

Dave Engleson, EE Specialist, retired
Wisconsin Department of Public Instruction
Madison

Frank Evans, Ph. D.
Office of Educational Accountability
Wisconsin Department of Public Instruction
Madison

Judy Klippel, Director
Havenwoods Environmental Center
Milwaukee

Tim Kooi, former Administrator
Hartland-Lakeside Schools
Hartland

Jennie Lane, Coordinator of Curriculum Development
Wisconsin K-12 Energy Education Project
Wisconsin Center for Environmental Education
College of Natural Resources
University of Wisconsin-Stevens Point

Don Lutz, Middle School Teacher
Marathon Middle School
Marathon City

Patricia Marinac
Science Program Leader
Appleton Area School District

Dr. Larry Miller, Chairperson, retired
Department of Education
Ripon College

Phyllis Peri, EE Resource/Network Coordinator
Wisconsin Center for Environmental Education
College of Natural Resources
University of Wisconsin-Stevens Point

Dr. Jay Price
Education Research
School of Education
University of Wisconsin-Stevens Point

Anna Quale, Middle School Teacher
Walker Middle School
Sturgeon Bay

Dr. Dan Sivek, Secondary Education Specialist
Wisconsin Center for Environmental Education
College of Natural Resources
University of Wisconsin-Stevens Point

Tom Stefonek, Ph.D., Director
Bureau of Achievement Testing
Wisconsin Department of Public Instruction
Madison

Dr. Richard Wilke, Associate Dean
College of Natural Resources
University of Wisconsin-Stevens Point

Dr. Dennis Yockers, Elementary/Middle School Specialist
Wisconsin Center for Environmental Education
College of Natural Resources
University of Wisconsin-Stevens Point

Administrator Assessment Advisory Council

Emery Babcock, Assistant Superintendent of Curriculum and Instruction
School District of Stevens Point

Kenneth Camlek, Principal
Rosholt Elementary School

Dr. Randy Champeau, Director
Wisconsin Center for Environmental Education
College of Natural Resources
University of Wisconsin-Stevens Point

Dr. Claude Deck, District Administrator, retired
School District of Onalaska

John Doyle, Principal, retired
Cuba City High School

Monte Hottmann, District Administrator
School District of Cambridge

Gary Loertscher, P-6 Principal
P-12 Director of Instruction
School District of Belleville

Dr. Corky McReynolds, Director
Treehaven Field Station
College of Natural Resources
University of Wisconsin-Stevens Point

Lois Meinking, Principal
West Side School
Mauston

Ann Quale, Middle School Teacher
Walker Middle School
Sturgeon Bay

Dr. Leslie Owen Wilson, Associate Professor of Education
College of Professional Studies
University of Wisconsin-Stevens Point

Jim Yeakey, Principal, retired
Franklin Middle School
Shawano

Dr. Dennis Yockers, Elementary/Middle School Specialist
Wisconsin Center for Environmental Education
College of Natural Resources
University of Wisconsin-Stevens Point

About the Wisconsin Environmental Education Board

A 1990 legislative initiative established the Wisconsin Environmental Education Board (WEEB). Its mission is to "Provide leadership in the development of learning opportunities that empower Wisconsin citizens with the knowledge and skills needed to make wise environmental decisions and take responsible actions in their personal lives, work places, and communities." The WEEB administers an annual small grants program of $200,000 which is distributed based on the merits of proposals submitted under specific guidelines. For information on the WEEB or the grants program contact: Wisconsin Environmental Education Board, P.O. Box 7841, Madison, WI 53707-7841, or call 608-266-3155.

Present members of the WEEB and the institutions they represent are as follows:

Jack Finger, Chairperson
Environmental Educators Representative
Waukesha

Spencer Black
Legislative Representative, State Assembly
Madison

Brian Burke
Legislative Representative, State Senate
Milwaukee

Cynthia Georgeson
Business/Industry Representative
Racine

Robin Harris
University of Wisconsin System Representative
Madison

Craig Karr
Department of Natural Resources Representative
Madison

Rick Koziel
Nature Centers/Zoos Representative
Fall Creek

Dan Kvalheim
Agriculture Representative
Sun Prairie

Bill Neuhaus
Labor Representative
Union Grove

Pauli Nikolay
Department of Public Instruction Representative
Madison

Tom Ourada
Legislative Representative, State Assembly
Madison

Bill Rockwell
Wisconsin Technical College System Representative
Madison

***Harold Spencer**
Conservation Organizations Representative
Janesville

Rick Wilke
Higher Education Representative
Stevens Point

*Harold Spencer passed away on Nov. 27, 1996. He was a longtime board member of the Wisconsin Wildlife Federation as well as being active on the WEEB. His wife, Marge, sent the following message as this report was being prepared. "On behalf of my husband Harold Spencer, thank you for recognizing his contributions to this educational project. Harold understood the enormous importance of environmental education in our schools. Not only does it provide good enhancement to any science courses, but instills in our youth that there is a responsibility to protect and preserve our environment and keep it viable in the future." Harold can be remembered as an outstanding leader in protecting Wisconsin's environment and the quality of life for its citizens. We will miss you Harold!

About the Wisconsin Center for Environmental Education

The Wisconsin Center for Environmental Education was established by a 1990 legislative initiative. It was placed in the University of Wisconsin System, College of Natural Resources at UW-Stevens Point. The mission of the WCEE is to "Promote, develop, disseminate, implement and evaluate environmental education programs for K-12 teachers and students in Wisconsin."

Core staff of the WCEE are as follows:

Randy Champeau, Ph.D., Director
Dan Sivek, Ph.D., Secondary Education Specialist
Dennis Yockers, Ph.D., Elementary/Middle School Specialist
Phyllis Peri, M.S., EE Network/Resource Coordinator
Anne Green, Outreach Program Coordinator
Carol Wake, Office Management

The WCEE houses one of the largest EE curriculum materials collections in the nation. It offers university credited in-service courses and an M.S. program in EE leadership for teachers. The WCEE staff consults with schools on program development and evaluation. If you would like to visit or contact the WCEE, it is located at the University of Wisconsin-Stevens Point campus.

Preface: About the Title "Are We Walking the Talk?"

"The Talk" in the rooms and halls of K-12 education in Wisconsin overwhelmingly supports the need to initiate, develop, and improve environmental education (EE) in our schools. This perspective is qualified and quantified by the results of the statewide student, teacher, and administrator assessments reported on in this document. The follow-up question might be, "If this is 'The Talk,' what are our schools doing about it?" or "Are We Walking the Talk?"

Wisconsin teacher education and curriculum mandates relative to EE seem to be effective given that this study found teachers were more active in providing EE if they had pre-service training and/or if they are working in a district with a functional EE curriculum plan. There is, however, much room for continued improvement which is validated by the questionable achievement of students on the environmental literacy assessment. Students' cognitive scores were low and they suggested that they would like to be exposed to more EE in their classrooms. Contrary to the students' request, there are a number of schools and teachers which admittedly are not offering quality EE experiences for their students.

The data in this document suggests that it is fair to say Wisconsin has begun "Walking the Talk" on environmental education, but more work needs to be done on improving the quality of EE where it is presently provided, and quality programs need to be initiated in schools where they are not being provided. There seems to be no question that environmental education is needed and desired in our schools.

Some Key Findings

In general...

...Wisconsin students, teachers, and administrators overwhelmingly believe education about the environment should be an important part of the core educational experience of K-12 students.

Wisconsin Students....

....believe environmental problems can be prevented and solved and feel they have a personal responsibility to help prevent and solve such problems.

....felt all sectors of society including government, business/industry, agriculture, education and family have a responsibility to maintain environmental quality.

....demonstrated cognitive scores (knowledge) which were considered low relative to ecological understanding and awareness of environmental issues.

....perceived themselves as moderately involved in selected personal and common environmental actions (e.g., recycling). They did not see themselves as using consumer practices to effect improvement of environmental quality.

....at the elementary level felt school and special activities like field trips contributed most to their understanding of environmental concerns.

....at the secondary level felt television and self-directed reading contributed most to their understanding of environmental concerns.

Wisconsin Teachers...

....felt it was a "good idea" to mandate EE curriculum plans in the schools.

....felt that pre-service teachers should have course work in EE.

....reported that more than 50% of the schools do not have an EE curriculum plan in operation.

....felt that infusion into other subjects was the most desirable way to pursue EE.

....felt time, materials, and training were factors that influence the offering of EE.

Wisconsin School Administrators (Principals and Curriculum Directors)...

....felt that environmental education should be a priority and that school districts should be required to develop and implement environmental education curriculum plans.

....reported that about a third of their ranks did not have the knowledge or background needed to promote EE in their schools.

....reported that from 20-40% of their schools do not have EE curriculum plans in operation and many that do have plans were concerned about the quality of those plans.

....reported that lack of funding, time and personnel were factors impacting the offering of EE in their schools.

....felt teachers needed to express more of an interest in EE.

....reported taking relatively more passive actions (e.g. verbal support, dissemination of information) than aggressive actions (e.g. funding, release time, or hiring of appropriate personnel) to support EE.

Table of Contents

List of Appendices

Introduction

As science and society strive to gain more insight into how the world works, it is clear that one recurring axiom is that the natural environment plays a direct and significant role in determining human quality of life. As a result, citizens, on a daily basis, are expected to assimilate and act upon a growing list of environmental concepts such as sustainability, conservation, water quality, air quality, energy alternatives, solid and hazardous waste, recycling, etc. Additionally, poll after poll (Dunlap, 1992; Roper, 1992, 1995) indicate that the citizenry of the United States believe it is right and good that the public develop an environmental literacy or the ability to factor environmental ideals into individual lifestyles and social norms.

In the United States, an obvious indication of the societal commitment to environmental literacy can be found in the growing number of states that are working to establish or strengthen environmental education in their K-12 schools (Ruskey and Wilke, 1994). Wisconsin is an excellent case in point. The Wisconsin legislature has enacted several pieces of legislation intended to promote the development of environmental education within the state's K-12 schools. This type of legislation was instituted as far back as 1938.

Created in 1990, the Wisconsin Center for Environmental Education (WCEE) represents one of the more recent legislative initiatives established to assist schools in the development of environmental education. As part of its responsibilities, the legislature mandated that the WCEE assess the environmental education status and needs of Wisconsin students and teachers. The intent of this assessment was to identify avenues for promoting, facilitating, and establishing quality environmental education programs within the K-12 schools of Wisconsin.

Over the last four years, the WCEE has been actively involved in collecting data on the environmental literacy and needs of the state's students, teachers, and school administrators. With support and guidance from the Wisconsin Environmental Education Board and the Wisconsin Department of Public Instruction, the WCEE conducted an environmental literacy assessment of over 3,500 fifth grade and high school students. Additionally, over 900 teachers were surveyed to determine their perceived competencies and needs related to environmental education. Finally, more than 1,100 Wisconsin school administrators, (i.e., principals and curriculum coordinators) were surveyed to determine the degree to which they support environmental education and to learn what they felt were the most pressing needs related to the development of environmental education in Wisconsin schools.

This report combines the results and conclusions of the individual studies to provide the first comprehensive profile of K-12 environmental education in Wisconsin schools. Sections I through III of this document contain a summary description of the data collection processes, results, and conclusions as they respectively relate to the student, teacher, and administrator assessments. Copies of the data collection instruments with results are located in Appendices A, B, C, and D. Section IV presents comprehensive findings, implications, and strategies for improving environmental education in Wisconsin based on integration of results from the studies. If reviewed and interpreted appropriately, educators in Wisconsin can use the results presented here to significantly improve the process of environmental education in Wisconsin schools.

Introduction and Purpose

What do Wisconsin students know, feel, and do about environmental problems and issues? Are Wisconsin schools providing an educational experience that includes development of student environmental literacy? In order to gain insight into these questions and others, an environmental literacy assessment of over 3,500 students was conducted in 1994 by the Wisconsin Center for Environmental Education.

The goal of the student assessments was to provide feedback to Wisconsin educators on the general level of environmental literacy in the statewide population of K-12 students. This information could then be used for improving the quality of environmental education in our schools. The assessment instruments were not developed for the diagnostic evaluation of individuals or to compare individual schools or districts. They were developed to provide an overview of representative populations of students in the state.

Development of the Assessments

The development of the student environmental literacy assessments involved an extensive three-year research, writing, evaluation and implementation process. Two environmental education specialists from the Wisconsin Center for Environmental Education served as project staff. The assessment project was guided throughout by a statewide advisory council made up of individuals representing elementary and secondary classroom teachers, school administrators, university professors, the Department of Natural Resources, the Department of Public Instruction, the Wisconsin Association for Environmental Education, and the Wisconsin Education Association Council.

The advisory council determined that testing a random sample of the states' fifth and eleventh grade populations would be sufficient to provide an adequate perspective on the degree of student environmental literacy across the state. After an exhaustive review of research related to environmental literacy assessment, a framework or outline was developed to guide construction of questions to be used in the assessment instruments (i.e., tests). A summary of the framework is presented below with a more detailed version included in Appendix E.

I. Affective learning outcomes
   - A. environmental sensitivity
   - B. values related to prevention and remediation of environmental problems and issues

II. Perspectives on environmentally responsible behavior
   - A. locus of control (perception of personal efficacy; do students feel they, as individuals, can have an impact)
   - B. assumption of personal responsibility

III. Environmentally responsible behaviors
   - A. ecomanagement (i.e., habitat management)
   - B. economic action
   - C. persuasion
   - D. political action
   - E. legal action

IV. Cognitive learning outcomes
   - A. knowledge of ecological foundations
   - B. knowledge of environmental problems and issues
   - C. knowledge of environmental issue investigation and action strategies

Based on the framework, specific learner objectives (expectations as to what students of these ages should be learning in the schools about the environment) were drafted. Teachers from across the state were employed to review the framework and objectives and to assist in the design of appropriate assessment questions.

After a pool of questions was developed, they were again sent out to educators who evaluated their validity, readability, and overall appropriateness for the given grade level. The test items that survived the educator reviews were then administered in a series of pilot tests to over 250 fifth and eleventh

grade students. Pilots were conducted so that statistical item analysis could be done on each question in the pool (Appendix F).

Test items that were evaluated to be appropriate by educators and showed acceptable item analysis results were then sampled from to develop a draft assessment instrument for each of the two grade levels. These draft instruments were again piloted with over 1,000 students from the fifth and eleventh grades. The analysis and results of these pilots were then used to construct the final instruments that were used in the statewide assessment.

Both the fifth and eleventh grade tests were designed to assess student perspectives relative to the four areas outlined above. Attitudes toward the environment and perspectives on behavior related to environment were surveyed using a Likert scale (strongly agree to strongly disagree, Part Two of Appendices A and B). Student behaviors were assessed by asking students to report frequencies of various citizen or student actions related to the environment, again using a Likert-type scale (Part Three of Appendices A and B). Cognitive knowledge about the environment and associated issues was assessed with multiple choice "best answer" questions (Part Four of Appendices A and B).

The instruments were designed to be administered in a 40 minute period. The total number of items on the fifth grade test was 79 and there were 90 items on the eleventh grade test. Students responded to all items on computer scored answer forms.

Table S.1 1994 Student Environmental Literacy Assessment Sample

	Fifth Grade	High School	Total
# School Districts	59	62	*102
# Classrooms	82	82	164
# Students (N)	1,854	1,807	3,661

* Samples from 19 districts included classrooms

Populations and Survey Administration

During the 1994 school year, 105 school districts were contacted by the project staff and requested to participate in the Wisconsin Environmental Literacy Assessment Project. The districts were randomly selected by the Department of Public Instruction (DPI) based on a desired sample size of 1,500-2,000 Wisconsin students at both the fifth and eleventh grade levels. The resulting sample included 82 classrooms at each grade level totaling 1,854 fifth grade and 1,807 high school students (Table S.1).

A letter was sent to each district administrator explaining the project and requesting his/her support and assistance. All but three districts agreed to participate in the project. Each district was asked to select a predetermined number of "typical" fifth and/or eleventh grade classrooms to participate in the survey. This proportionally predetermined number was provided by a DPI statistician based on the districts' total student population.

The assessment packages were mailed out in February 1994 with instructions to the teachers administering the tests. Teachers were given a period of four weeks to administer the tests and return the completed answer forms to the Wisconsin Center for Environmental Education. In addition to administering the tests, teachers were asked to complete a brief survey requesting basic information about the students taking the test (Appendix G).

Students responding to the assessments were placed into the following groups for analysis of results. All respondents at each of the two grade levels were placed in a group titled the "Total Population" (TP; N= 1,854 fifth grade and 1,807 high school students). "Environmentally Literate" (EL) subpopulations of students were also identified in each of these populations by selecting students who were either self-identified or teacher-identified as being above average in their understanding of environmental concerns (n = 679 fifth grade students and 669 high school students). A third

group consisted of the students at each grade level who were neither self- nor teacher-identified as environmentally literate. Those subpopulations were titled the "Not Identified" (NI) groups.

Results

Results of the student environmental literacy assessments are herein presented relative to major response trends that were identified in the four sections of each assessment (i.e. demographic, affective, behavior, and cognitive). In both the fifth and eleventh grade instruments, Part One was established to collect demographic data. Classroom teachers administering the tests were also asked to supply background or demographic information on their school and students. Part Two (the affective subscale) dealt with attitudes, locus of control, and assumption of personal responsibility for environmental quality. Part Three (the behavior subscale) allowed for an actual self reporting of student behaviors related to the environment. Part Four (the cognitive subscale) assessed student awareness and knowledge related to ecology, the environment, and environmental issues and actions.

Part One: Demographic Results

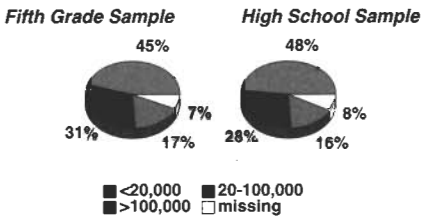
Demographic results include responses to questions 1-4 on the elementary and questions 1-5 on the secondary instrument. Teachers administering the tests also provided some demographic information on the students in their respective schools (Appendix G).

Was the assessment representative of the population of Wisconsin K-12 youth?

As much as possible, given the random sampling procedures used by the Department of Public Instruction, the state advisory council feels that responses to these assessments are representative of all 5th and 11th grade students in Wisconsin.

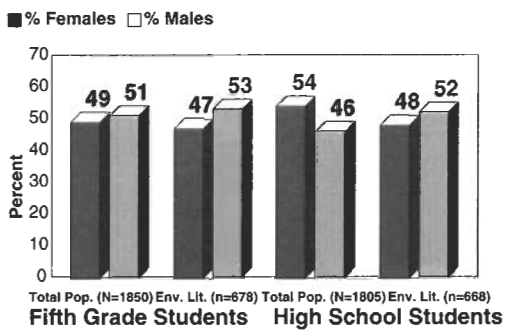
Community Size: Most of both the fifth grade and high school classrooms participating in the assessment were composed of students from rural or small towns of less than 20,000 people, approximately 30 % were from communities of 20,000 to 100,000 and 16 % of both populations of students were from communities of more than 100,000 (Figure S.1).

Figure S.1: Population Size of Communities Where Sample Classrooms were Located
(N = 82 classrooms for each grade level)



Gender: Approximately equal numbers of females (49%) and males (51%) completed the fifth grade assessment. The "environmentally literate" group at the fifth grade level was 47% female and 53% male. At the high school level, more females (54%) than males (46%) completed the assessment test, but these percentages were nearly reversed in the identified "environmentally literate" high school group (48% female, 52% male) (Figure S.2).

Figure S.2: Gender of Students in Sample Populations

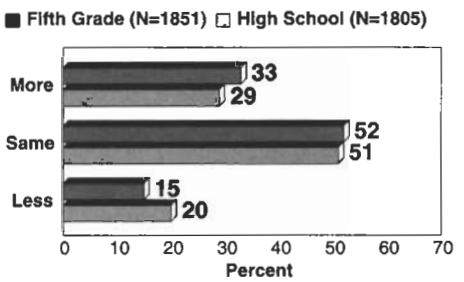


Are students interested in learning about the environment?

Yes, there seems to be considerable student interest in receiving instruction about the environment. A majority of elementary and high school respondents indicated that education about the environment is of interest to them. Eighty-five percent of the elementary students responded favorably to studying environmental topics. Similarly, eighty percent of high school respondents suggested that studying environmental topics was more interesting

or as interesting as studying other subjects (Figure S.3).

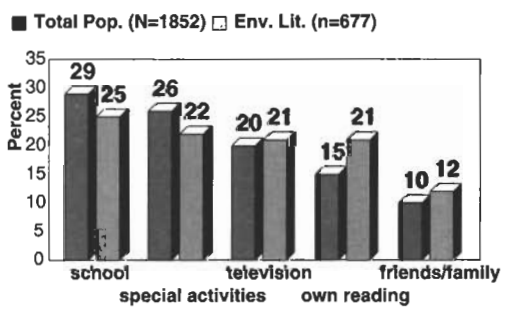
Figure S.3: Degree of Interest in Studying Environmental Topics Relative to Other Subjects (#2)



Where do students feel they are learning the most about the environment?

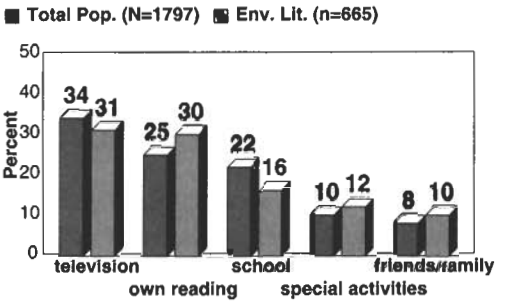
The majority of fifth graders felt school field trips (29%) and special programs or activities (26%) contributed the most to their understanding of environmental problems followed by television (20%) (Figure S.4).

Figure S.4: Fifth Grade Students' Primary Source of Environmental Understanding (#4)



Television was the most frequently chosen source of information identified by high school students as contributing most to their understanding of environmental problems (34%), followed by books, newspapers, and magazines (25%). Only 22% of the high school students felt school contributed most to their understanding of the environment (Figure S.5).

Figure S.5: High School Students' Primary Source of Environmental Understanding (#4)



Part Two: Attitudes and Perspectives on Environmentally Responsible Behaviors

This part of the assessment contained statements relating to students' attitudes towards the environment and environmental problems as well as statements related to their beliefs about their own ability and responsibility to make change relative to the environment. The students responded to each statement using a five-point Likert-type scale (strongly agree to strongly disagree). Questions 5-26 of the fifth grade and 6-35 of the secondary assessment comprise this part (Appendices A and B).

Are students concerned about maintaining environmental quality and solving environmental problems?

Yes, responses would suggest that students are concerned. The fifth grade students related their concern about the environment and environmental issues by suggesting that their schools should have more lessons about the environment (Figure S.6). They also felt more money should be spent to solve environmental problems (Figure S.7) and to teach people about environmental problems (Figure S.8).

Figure S.6: My school should have more lessons about the environment. (#8)

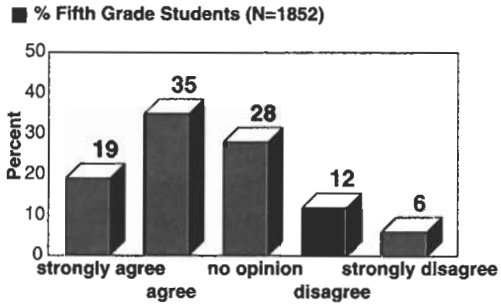


Figure S.7: More money should be spent to solve environmental problems. (#5)

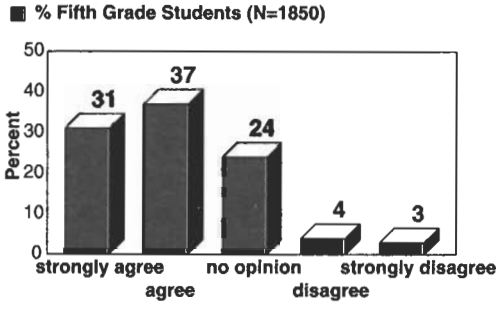
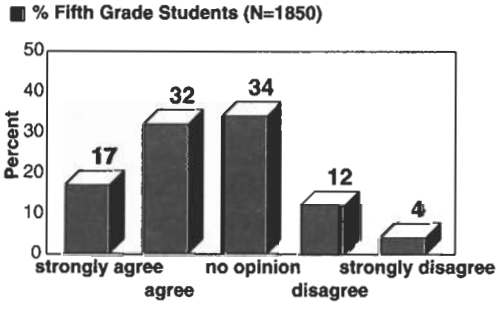


Figure S.8: More money should be spent teaching people about the environment and its problems. (#7)



The majority (67%) of high school students disagreed with the statement that environmental concerns or problems have been exaggerated (Figure S.9). Similarly, 67% stated that knowing about environmental issues is important to them (Figure S.10).

Figure S.9: I think most of the concern about environmental problems has been exaggerated. (#10

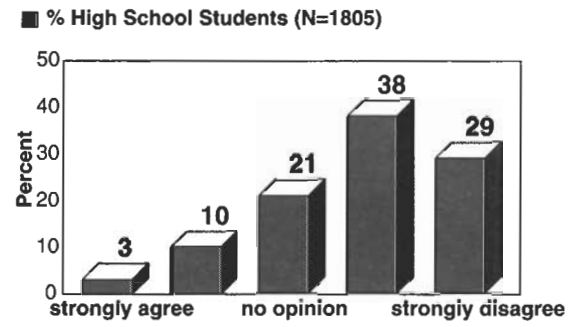
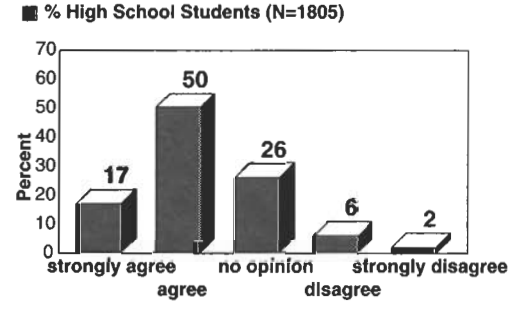


Figure S.10: Knowing about environmental problems and issues is important to me. (#11)



High school students also felt that industrial growth and development should be pursued within the context of appropriate pollution control (Figure S.11). In fact, the majority (71%) felt that there were not enough laws available to protect the environment (Figure S.12). High school students also reported being concerned about a variety of environmental problems including waste, energy, species extinction, environmental health hazards, air quality,and deforestation (Appendix B, items 13, 22, 23, 24, 25, 27, 28).

Figure S.11: A community's pollution regulations should not interfere with industrial growth and development. (#12)

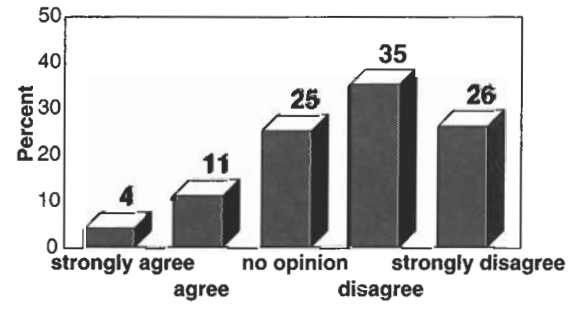
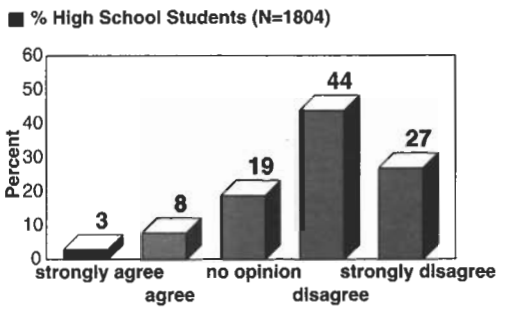


Figure S.12: There are already enough laws to protect the environment. (#17)



Do students believe environmental problems can be solved?

Yes, both groups of students (fifth grade and high school) believed environmental problems can be solved and that they have a personal responsibility to help solve the problems.

Fifth graders did not feel it was a waste of time to work on environmental problems (Figure S.13) and they disagreed with the statement that it is too hard to solve environmental problems (Figure S.14). These students also indicated that they were willing to change their own behaviors in order to solve environmental problems. Figure S.15 shows that almost half of the fifth grade students surveyed said that they would be willing to watch less television to save energy. The majority of these students also disagreed with the statement that the things they do have no effect on the environment (Figure S.16).

Figure S.13: It is a waste of time to work to solve environmental problems. (#19)

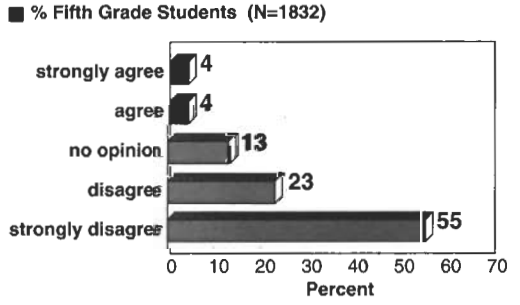


Figure S.14: It is too hard to solve environmental problems. (#24)

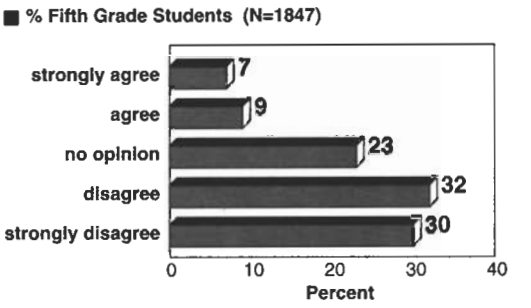


Figure S.15: To save energy, I am willing to watch one hour less of television per day. (#16)

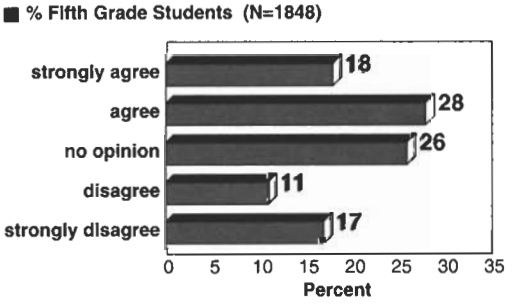
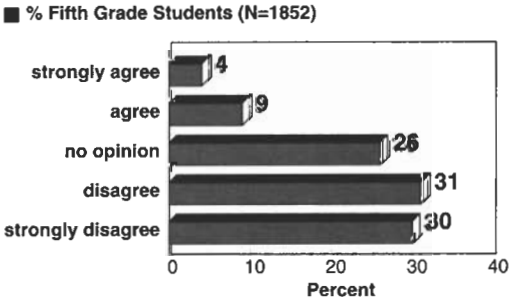


Figure S.16: Things I do have no effect on the quality of the environment. (#21)



High school students disagreed with the statement that there is not much they can do to help solve environmental problems (Figure S.17). They believe they can personally contribute to the solution of environmental issues (Figure S.18).

Figure S.17: There is not much I can do that will help solve environmental problems. (#30)

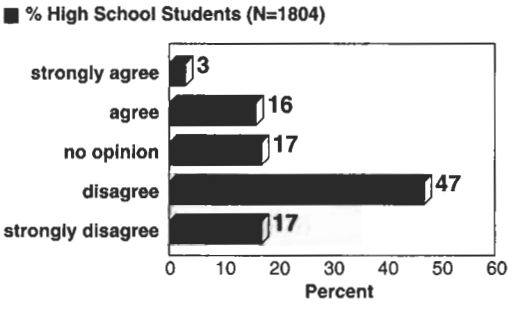
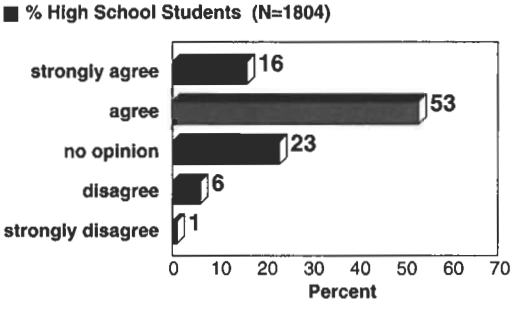


Figure S.18: I believe that I can contribute to the solution of environmental problems by my actions. (#31)



Part Three: Environmentally Responsible Behaviors/Actions

In this part, students were asked to respond to statements about their personal environmental actions or behavior. The students responded to each statement using a five-point Likert-type scale ranging from "never" to "almost always." Questions 27-40 of the fifth grade and 36-51 of the secondary assessment comprised this part (Appendices A and B).

Do students perceive themselves as being involved in environmental action taking?

"To a moderate extent" would seem to be the best description of the perceived action taken by students. Fifth grade and high school students reported that they almost always or often take direct action like saving energy, waste reduction/recycling, and conserving water (Figures S.19, S.20). However, when it comes to influencing others such as family and friends, most students tend to show less commitment (Figures S.21, S.22). For example, high school students felt they very seldom encouraged others to recycle or to stop activities that might negatively impact the environment.

Figure S.19: Reported Frequencies of Selected Environmental Actions Taken by Fifth Grade Students
(N = approximately 1,800)

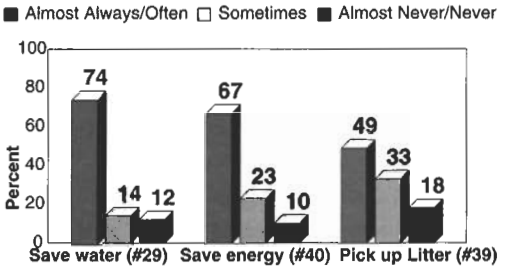


Figure S.20: Reported Frequencies of Selected Environmental Actions Taken by High School Students
(N = approximately 1,800)

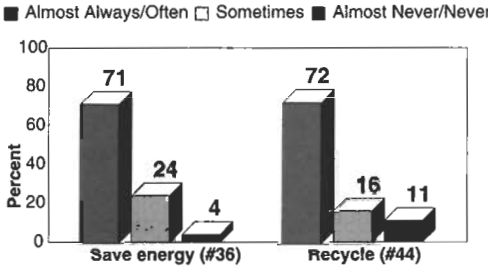


Figure S.21: Reported Frequencies of Selected Environmental Actions Taken by Fifth Grade Students
(N = approximately 1,800)

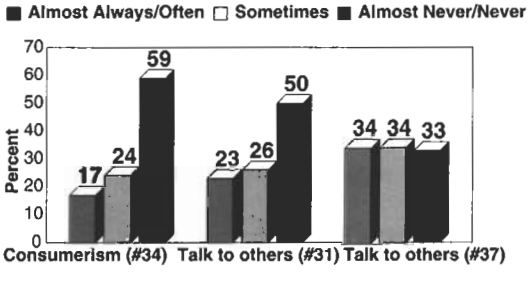
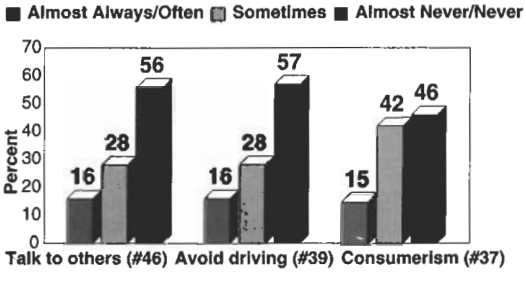


Figure S.22: Reported Frequencies of Selected Environmental Actions Taken by High School Students
(N = approximately 1,800)



Similarly, purchasing power was not pursued as an option for environmental action by students. They did not to any great extent see themselves as purchasing or avoiding the purchase of products because of environmental concerns.

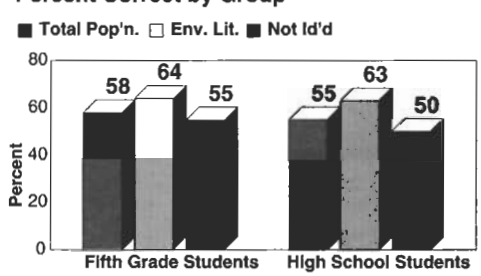
Part Four: Knowledge of Ecological Foundations and Environmental Issues

This part contained objective multiple choice questions that were intended to test student knowledge and awareness about ecology and environmental problems. Questions 41-79 of the fifth grade and questions 52-90 of the high school assessments comprised this part.

Do students have adequate knowledge and awareness of ecology and contemporary environmental issues?

The best answer to this question seems to be "Not quite passing." Figure S.23 shows that the total population (TP) of fifth grade students scored an average mean of 58%. That is, on the average they answered 58% of the questions correctly. Similarly, the total population of high school students, on the average, answered 55% of the cognitive questions correctly. In both cases (i.e., 58% or 55%), these scores would fall short of the traditional benchmark of 70% as passing. It is important to remember that the questions in this test were developed, reviewed, and selected by relevant teachers with the assumption that students at the given level should be able to answer the questions correctly.

Figure S.23: Cognitive Subscale Percent Correct by Group



Those students who were identified as more prone towards environmental literacy (EL) scored significantly higher than those who were not identified (NI). Figure S.23 shows that EL fifth grade students scored 64% and EL high school students scored 63% compared to 55% and 50% respectively for the not identified students. This would indicate that the test is sensitive enough to discriminate between levels of achievement. However, the EL scores are still lower than the traditional passing mark of 70%.

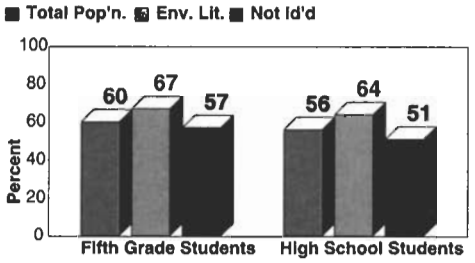
A more positive interpretation of the results for both the high school and fifth grade is that a majority of students (>50%) selected the preferred answer for most of the questions. This might indicate a majority of students are at least beginning to develop a basic awareness of ecological concepts. Similarly, the majority of students seem to be developing basic awareness of the existence and types of environmental issues that are facing society.

The overall cognitive section can also be further broken down into two separate areas of concentration or subscales. Questions 41-56 in the fifth grade and questions 52-69 in the high school instrument dealt with the understanding of ecological concepts and processes. The second area, knowledge of contemporary environmental issues, was assessed with questions 57-79 in the fifth grade test and questions 70-90 in the high school test.

Knowledge of Ecological Foundations

The total population of fifth grade students scored an average mean of 60% on the ecological knowledge questions (Figure S.24). There seems to be an inconsistency or lack of an obvious pattern to these responses. They did well with some basic ecological terms (e.g., Appendix A #42, #43), however, they were limited in their understanding of how energy flows through a system (Appendix A #50, #51, #53). It was particularly disheartening that so many students were unable to identify the sun as the original source of energy for living things.

Figure S.24: Ecological Knowledge Percent Correct by Group



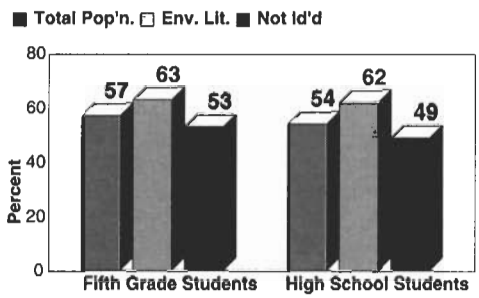
The secondary students had a similar response pattern to that of the fifth grade students (Figure S.24). However, their average mean score was lower at 56%. They, too, seemed to be inconsistent or limited in their understanding of ecological concepts. They did fairly well on common terms like adaptation, habitat, and decomposers (Appendix B #53-55). However, they had obvious problems with more broad based concepts such as carrying capacity and chemical build-up (Appendix B #63 and #64).

In general, both the fifth grade and the high school scores on the ecology questions were lower than expected by the educators developing the test questions. Additionally, it is difficult to understand why the high school students scored even lower on the average than did the fifth grade students given the tests for each population were developed from the same framework.

Knowledge of Environmental Issues

The second subscale of the cognitive portion of the test consisted of questions about awareness and knowledge of contemporary environmental issues. Again, average mean scores of the total population were not overly impressive (Figure S.25). Fifth grade students scored an average mean of 57%. The high school students scored an average mean of 54%. The environmentally literate group scored significantly higher with average mean scores of 63% and 62% respectively.

Figure S.25: Knowledge of Environmental Issues Percent Correct by Group



Each test included questions on issues related to energy, population, waste, water, air, soil and biodiversity. Given that an understanding of environmental issues requires a higher cognitive level of operation, it was hoped that more high school students would consistently show greater knowledge of issues than fifth graders. However, as Figure S.25 shows, this was not the case.

Summary

The Wisconsin Student Environmental Literacy Assessment was administered to determine the status of the state's K-12 student population relative to environmental attitudes, knowledge, and behaviors. Results indicate that students feel education about the environment is important. They believe environmental issues can be prevented and remediated. They hold themselves and society responsible for proactively dealing with environmental issues. The students' ecological knowledge base was lower than the standards established by relevant educators. Students' personal behaviors or actions related to environmental concerns were inconsistent and seemingly without strong commitment. Implications and strategies related to these findings are presented in Section IV of this document.

Introduction and Purpose

What do Wisconsin K-12 teachers know, feel, and do relative to teaching about the environment and associated problems or issues? In order to gain insight into this question, the Wisconsin Center for Environmental Education conducted an assessment of over 900 teachers randomly selected from the public school elementary and secondary teachers in the state.

The goal of the assessment was to provide the Wisconsin Environmental Education Board, schools, and teacher education institutions with information that might help them evaluate and strengthen environmental education programming.

Development of the Assessment

The development of the teacher assessment involved an extensive two-year research, writing, evaluation, and implementation process. An environmental education specialist from the WCEE served as staff for the project. The project was guided by the same advisory council that was established for the student environmental literacy assessment project discussed in section one of this document.

After extensive deliberation, the advisory council determined that the following guiding questions would direct the development of the assessment instrument.

1. To what extent do teachers believe EE is important and should be taught?

2. To what extent do teachers perceive EE is progressing within their schools and classrooms?

3. What are the factors (incentives or barriers) that impact the offering of EE by teachers?

4. To what extent do teachers feel they are competent in teaching about the environment?

Based on the above "guiding questions" and as a result of several reviews and pilots, a final assessment instrument was developed (Appendix C). The instrument was designed to be administered by mail and completed in less than an hour.

The assessment was divided into five sections. Each section addressed one or more of the "guiding questions" developed by the advisory council.

Population and Survey Administration

Twelve teaching areas or disciplines were selected to sample from. The teaching areas included those stated in Wisconsin's EE mandates as well as other disciplines that might include environmental topics. Three percent of Wisconsin teachers from each discipline were randomly selected. The resulting total sample size was 1,545. The survey was sent out in mid-April 1992. Nonrespondents were sent a reminder postcard and then a second copy of the survey. The final response rate was 59% (N = 915, Table T.1).

All respondents filled out Section I of the survey (N = 915). Section II was filled out only by teachers who reported they do teach about the environment (n = 631). Table T.1 provides an overview of the response rate by discipline and what percent of each population indicated that they infuse EE.

Results

Results of the teacher assessment are herein presented relative to demographic information and the guiding questions that were developed by the advisory committee. Note again that results may be reported for all respondents (N = 915) or only for those who practice EE (n = 631).

Table T.1 Response rates and EE infusion of disciplines sampled (N = 906)

Discipline	Total surveys sent	Number of responses	Response rate (%)	Infuse EE(%)
Music	79	65	82	35
Art	52	41	79	73
Agriculture	9	7	78	100
Science	93	70	75	94
Home Economics	31	21	68	76
Health	28	13	64	62
Elementary	900	517	57	76
Tech Education	42	24	57	58
Social Studies	55	31	56	74
Business	30	15	50	27
Language Arts	120	63	42	51
Math	106	39	37	36
Total	1,545	*906	59	70

* nine teachers did not indicate their teaching area

Were respondents representative of the selected statewide teacher population?

All twelve teaching areas targeted for the survey responded. Math and Language Arts were the only areas that received less than a 50% return (Table T.1).

According to the Wisconsin Department of Public Instruction (WDPI), for this state's teacher population the average years of teaching experience is 15 and the gender ratio is about 66% female to 34% male. The respondents to the EE teacher assessment had an average of about 15 years teaching (Table T.2) and were 69% female and 31% male (Table T.3). Additionally, the DPI reports that 23% of the Wisconsin teaching population graduated after 1985. Similarly, 29% of the survey respondents were found to have graduated after 1985. Based on the demographic results, the 915 respondents seem to reflect or be a representative sample of the state teacher population.

Table T.2 Number of years teaching experience

(N = 914) Number of years teaching	(n)	(%)
1 - 5	155	17
6 - 10	133	14
11 - 15	139	15
16 - 20	170	19
21 - 25	158	17
Over 25 years	159	17

Table T.3 Gender ratio of respondents to teacher survey (N = 915)

Gender	(n)	(%)
Female	629	69
Male	286	31

To what extent do teachers believe EE is important and should be taught?

Teachers, in general, seem to show substantial support for environmental education. Of the teachers presently infusing EE, over 80% agreed or strongly agreed that EE should be a priority in the schools (Figure T.1). In fact, 68% of these same teachers felt it was a "good idea" to mandate EE curriculum plans in the schools (Figure T.2) and 64% felt that pre-service teachers should have course work in EE (Figure T.3). Further evidence of the perceived importance of EE is that 91% said the EE mandate is <u>not</u> the reason they are infusing EE (i.e., other reasons motivate them to infuse) (Figure T.4).

Figure T.1 EE should be considered a priority in our K-12 educational system. (n=623)

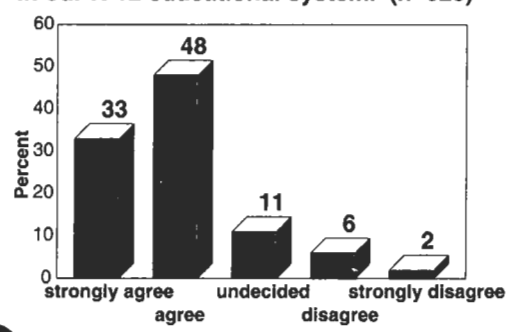


Figure T.2 It is a good idea to mandate that school districts develop and implement an EE curriculum plan. (n=624)

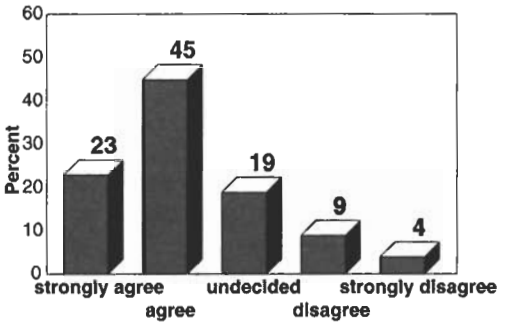


Figure T.3 Pre-service teachers should be required to take an EE methods class. (n=624)

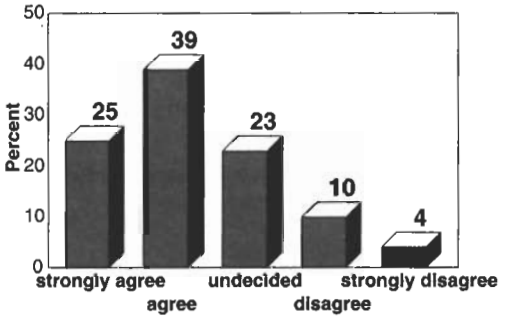
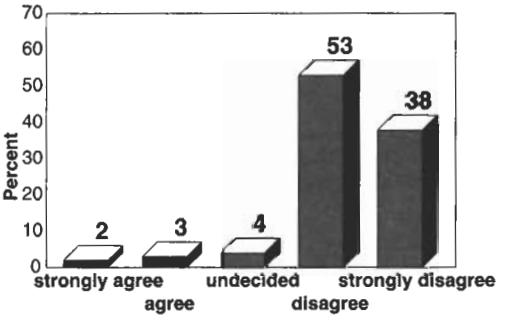


Figure T.4 The main reason I teach students about the environment is because it is mandated. (n=625)



To what extent do teachers perceive EE is established or progressing within their districts and classrooms?

The responses related to progress of EE in districts were very disheartening. According to a state mandate, school districts in Wisconsin were to have developed an EE curriculum plan by 1990. However, of the 905 respondents to the survey in 1992 only 30% reported that their district had such a plan. Over 52% were not sure, and 18% felt their school did not have a plan (Figure T.5).

The response was more positive when the teachers were asked if they infuse environmental education into their classroom curriculum. Over 69% responded that they do (Figure T.6). However, 42% of those teaching EE felt they spent less than 30 minutes per week teaching about the environment and 75% spend one hour or less per week (Figure T.7).

Figure T.5 Does your school district have a written EE curriculum plan? (N=905)

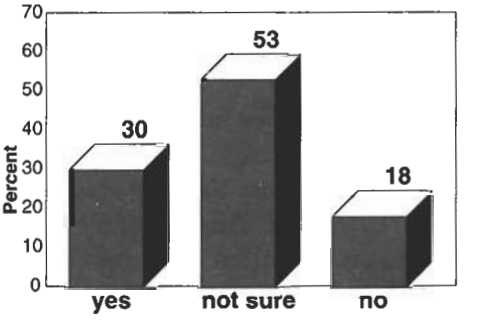


Figure T.6 Do you currently infuse education about the environment into your class curriculum? (N=915)

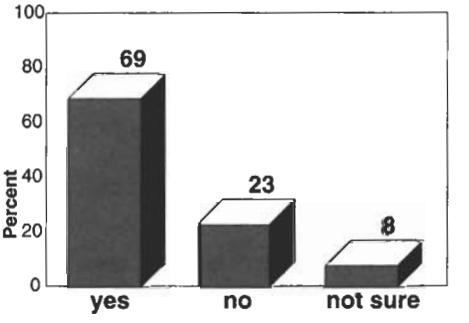
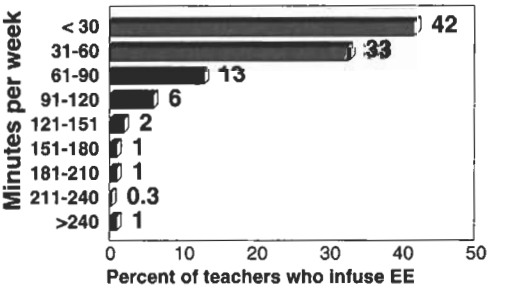


Figure T.7 For all subjects you teach, approximately how much time per week do you spend teaching about the environment? (N=618)



To what extent do teachers feel they are competent in teaching about the environment.

Teachers' overall perceived EE competencies were assessed by averaging their mean responses to all the items addressing the components of environmental literacy (cognitive, affective, behavioral) and perceived effectiveness. The responses for the individual items were assigned a value of from 1 (strongly disagree) to 5 (strongly agree). The average of the mean of all these responses (mean of means) is assigned a similar value scale. The overall mean response value for perceived competencies was 3.63. When teachers were asked specifically whether they believed they were effective in contributing to students' environmental literacy, the mean response was 3.84 (Table T.4). Both of these response values (i.e. falling between undecided and agree but closer to agree) indicate that teachers agree to some extent that they are effective and competent in teaching students about the environment.

Table T.4 Overall Perceived Competencies of Teachers Who Infuse EE (see Appendix C for complete items and means)

Effective at infusing EE (Item 5, M = 3.78)

Effective at addressing cognitive learning outcomes (Items 18-21, MM = 3.73)

Effective at addressing affective learning outcomes (Items 27-29, MM = 3.62)

Effective at addressing behavioral learning outcomes (Items 35, 36, 37, MM = 3.18)

Instruction contributes to environmental literacy (Item 40, M = 3.84)

Notes: Overall MM = 3.63 on a 5 point scale where 5=strongly agree and 1=strongly disagree. (n for the items listed ranged from 582 to 628)

Cognitive learning components

When presented with a list of 18 cognitive education methods that could be used to teach about the environment, 84% of the teachers said that more than half of the methods were valuable (Figure T.8). Only 49%, however, stated that they had used more than half of the methods effectively (Figure T.9). The three methods teachers most often reported using effectively were observations, audiovisuals, and lectures (Table T.5). Despite the apparent lack of diversity of methods, teachers agreed they were able to help students increase their cognitive understanding (MM = 3.73, Table T.4).

Figure T.8 Number of Cognitive Education Methods Teachers Feel Are Valuable for Teaching About the Environment (n=620)

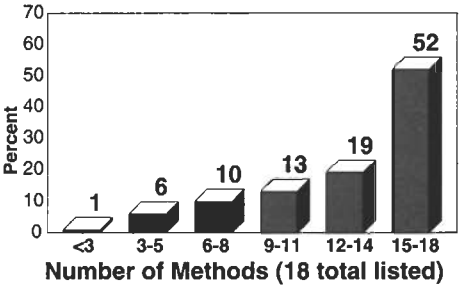


Figure T.9 Number of Cognitive Education Methods Teachers Report Using Effectively (n=610)

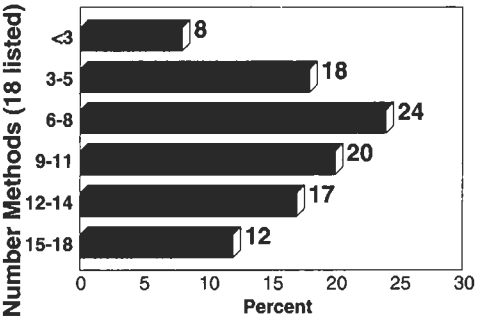


Table T.5 Cognitive Education Methods Teachers Reported Using Effectively (n=588)

Method	Frequency	%
Observations	479	81
Audiovisuals	407	69
Lectures	397	68
Problem Solving	390	66
Cooperative Learning	364	62
Writing, Art, Music	355	60
Outdoor Education	350	60
Experiments	343	58
Projects	299	51
Guided Discovery	294	50
Role Play	244	41
Self-direction	236	40
Env. Issue Investigation	206	35
Community Resources	202	34
Data Analysis	198	34
Simulations	134	23
Case Studies	115	20
Computers	106	18

(Note: Because multiple responses were chosen, the frequencies total more than the n and the percents total more than 100%)

Affective learning components

When asked to evaluate affective education methods, 21% of the teachers reported that all of the seven methods listed were valuable, but an equal number indicated they were not sure if any of these methods were valuable (Figure T.10). Only 3% of the teachers reported that they used all these methods effectively while 14% said they either do not use any of these methods or were unsure if they used any of these methods effectively (Figure T.11). The two methods teachers most often said they used effectively were sensory awareness and action learning (Table T.6). In summary, teachers moderately agreed that they were effective at using affective EE methods (MM 3.67, Table T.4)

Figure T.10 Number of Affective/Values Education Methods Teachers Feel Are Valuable for Teaching About the Environment (n=578)

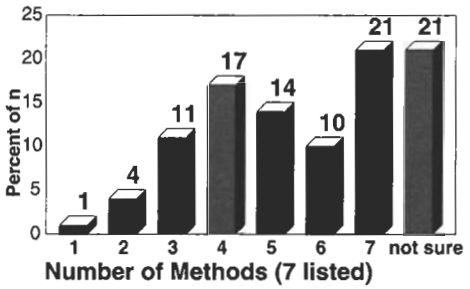


Figure T.11 Number of Affective/Values Education Methods Teachers Report Using Effectively (n=543)

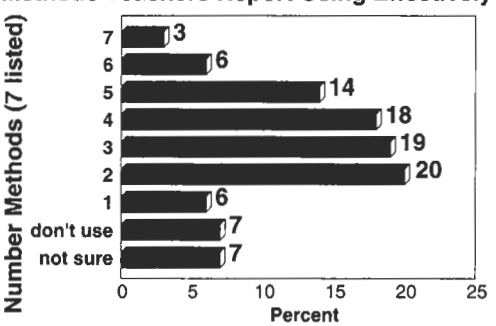


Table T.6 Affective/Values Education Methods Teachers Reported Using Effectively (n=503)

Method	Frequency	%
Sensory/Awareness	424	78
Action Learning	350	64
Values Clarification	261	48
Moral Development	242	45
Values Analysis	219	40
Behavior Modification	166	31
Inculcation	65	12

(Note: Because multiple responses were chosen, the frequencies total more than the n and the percents total more than 100%)

Respondents who indicated they do not use the affective education methods were asked to indicate a reason (from a choice of statements) for not using these methods. Approximately 34% reported that they may have used these methods but were not sure of what they were called. Another 21% indicated they do not know enough about the methods. There were most likely additional reasons not supplied because 20% of the teachers chose the response "none of the above." (Appendix C, Section IV, item 26)

Behavioral learning components

Of the survey respondents, 62% said they do and 38% reported that they do not or don't know if they involve students in any of the listed environmental action strategies (Figure T.12). The most frequently chosen reason for not involving students in these actions was inappropriateness for grade level (25%). Lack of time was also a common response (22%) (Table T.7). Only 1% of those reporting that they do involve students in any of the listed action strategies reported using all five of the strategies listed. About 73% felt effective in using only one or two of the methods (Figure T.13). The two methods respondents most frequently indicated they used effectively were ecomanagement and persuasion (Table T.8).

Figure T.12 Have you involved students in environmental action strategies? (n= 589)

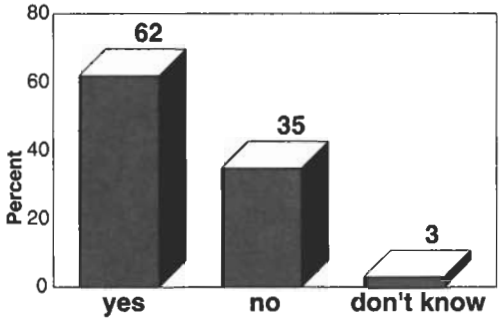


Table T.7 Main Reason for Not Involving Students in Environmental Action Strategies (n=319)

Reason	No. of teachers	%
It is inappropriate for grade level	79	25
There is no time	70	22
Do not have the knowledge	63	20
Actions not related to subject	49	15
Administration does not support	3	1
None of the above	55	17

Figure T.13 Number of Environmental Action Strategies Teachers Report Using Effectively (n=360)

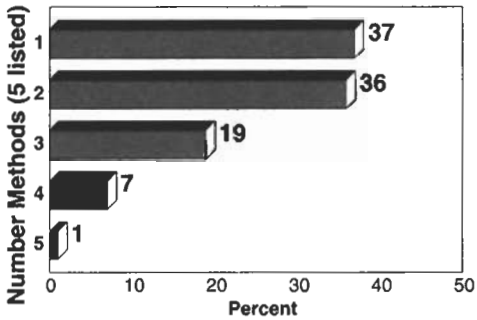


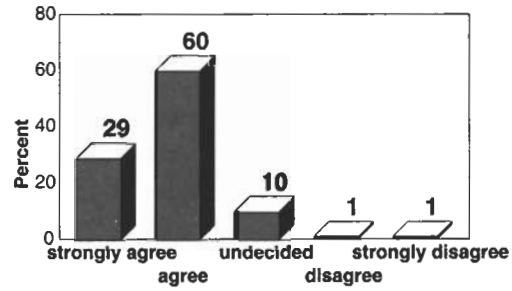
Table T.8 Environmental Action Strategies Teachers Reported Using Effectively (n=354)

Strategy	Frequency	%
Ecomanagement	271	77
Persuasion	238	67
Economic action	106	30
Political action	57	16
Legal action	12	3

(Note: Because multiple responses were chosen, the frequencies total more than the n and the percents total more than 100%)

Overall, respondents agreed that teachers should provide students with opportunities to gain actual experience in resolving environmental issues (Figure T.14). Teachers were undecided as to whether they are accomplishing this objective; their mean response in this competency area was 3.18 (Table T.4).

Figure T.14 Teachers should provide students with opportunities to gain actual experience in resolving environmental issues (n = 626)



What are the factors (incentives or barriers) that impact the offering of EE by teachers?

As stated previously, the final response rate for the survey was 915 teachers. Of these, approximately 31% (N = 284) indicated that they do not teach about the environment (Figure T.6).

Teachers who reported not infusing EE concepts were asked to indicate why they do not infuse EE (Table T.9). The most commonly reported reason was that they perceive EE as being unrelated to their subject area (25%). The second most frequently chosen response was lack of background in EE (24%). When asked what would influence them to teach about the environment, a third (33%) of the teachers selected the response of in-service training (Table T.10). The second most common response was better access to resources (26%).

Table T.9 Main Reason for Not Infusing EE (n=269)

Reason	No. of teachers	%
Concepts unrelated to subject	68	25
Do not have background	64	24
Do not have class time	37	14
Not enough prep time	20	7
Other things more important	19	7
Lack of resources or funding	12	4
School setting not conducive	7	3
Not appropriate for grade level	5	2
Other	37	14

Table T.10 Factors That Would Influence Teachers to Infuse EE into classes (n=243)

Factor	No. of teachers	%
More in-service classes on EE	79	33
Better access to resources	62	26
More prep time	44	18
More administration support	10	4
More funding	1	0.4
Other	47	19

For those teachers who reported they are infusing EE, there seems to be some correlation to in-servicing and district EE plans. That is, teachers who have taken EE in-service courses reported significantly higher responses to perceived competencies in, attitudes toward, and class time spent teaching about the environment (Appendix H). Similarly, those teachers who indicated that their school district has an EE plan (n = 271) reported greater perceived competencies and greater class time spent with regard to teaching about the environment (Appendix I).

Finally, a statistical analysis called regression analysis was performed to determine if any particular aspects of a teacher's background seemed to impact the amount of class time spent on EE. The areas accounting for most of the variability in amount of class time spent were participation in EE in-service education (37% of variability), number of in-service courses taken in EE (24% of variability), and frequency of reference to school district EE curriculum plan (33% of variability). These findings suggest that more EE in-service opportunities and use of EE curriculum plans may lead to more time spent on environmental education in the classroom.

Summary

The Wisconsin Teacher Assessment of Environmental Education was conducted to determine what the state's teacher population knows, feels, and does relative to teaching about the environment and associated issues. Findings indicated that teachers believed education about the environment is important enough to be mandated. They reported that districts could substantially improve EE by developing, improving, or operationalizing EE curriculum plans. They felt EE should be a part of pre-service teacher training. Indications were that the amount of EE offered by a teacher increased relative to the availability of an EE plan in their district and relative to the amount of personal EE training. Implications and strategies related to these findings are presented in Section IV of this document.

Introduction and Purpose

What do Wisconsin K-12 school administrators know, feel, and do about supporting environmental education in their schools? In order to gain insight into this question, the Wisconsin Center for Environmental Education (WCEE) conducted an assessment of over 1,100 principals and directors of curriculum across the state.

The goal of the assessment was to provide the Wisconsin Environmental Education Board, the Wisconsin Department of Public Instruction, and the WCEE with information on the administrative support or barriers to offering and improving environmental education in Wisconsin's schools.

Development of the Assessment

The development of the administrator assessment involved an extensive research, writing, evaluation and implementation process. An environmental education specialist from the WCEE served as the staff person for the project. The project was guided by a statewide advisory council made up of thirteen individuals including four university education professors, four principals, two directors of curriculum, two school superintendents, and one practicing teacher. Ultimately, the survey instruments were also reviewed and endorsed by the Wisconsin Association for Supervision and Curriculum Development and the Association of Wisconsin School Administrators. After extensive deliberation, the assessment staff and the advisory council determined that the following guiding questions would be used to direct the development of the assessment instrument.

1. What are school administrators' attitudes toward incorporating the content and process of environmental education in their schools?

2. To what degree are school administrators personally knowledgeable about EE and aware of the status of EE in their schools?

3. To what degree do school administrators provide support for EE in their schools?

4. What do school administrators identify as barriers to offering EE in their schools?

5. What do school administrators perceive as needs or incentives related to initiating, improving, or increasing EE in their schools?

Based on the above "guiding questions" and as a result of several reviews and pilots, a final assessment was developed (Appendix D). The assessment was designed to be administered by mail. It consisted of 40 questions and involved a response time of about 20 minutes. The assessment was divided into four sections. Each section addressed one or more of the guiding questions developed by the advisory committee.

Population and Survey Administration

It was decided to send the assessments to all the state's public school principals and directors of curriculum. The Department of Public Instruction provided the mailing list for the principals which totaled 1,818. Because the DPI did not have a mailing list of curriculum coordinators, all 427 school districts in Wisconsin were contacted by phone to identify who was filling the role of curriculum director. It was determined that, in many cases, it was the principal who was filling the role. However, in 308 cases directors of curriculum were identified as distinct positions. Thus, a total of 2,126 assessments were sent out in February of 1994. A total of 914 assessments (50%) were returned by principals and 209 (68%) were returned by directors of curriculum (grand total 1,123 or 53%).

Results

Results of the administrators' assessment are herein presented relative to the "guiding questions" that were identified by the advisory council.

What are school administrators' attitudes toward incorporating the content or process of environmental education in their schools?

"Positive" or "very positive" would be the best way to describe administrators' views toward incorporating the content and process of EE.

An overwhelming majority (80-90 %) believe that schools should provide students with experiences that will achieve the goals of environmental education (Figures A.1, A.2, A.3, A.4, and A.5). Approximately 70 % of school administrators agree that environmental education should be considered a priority (Figure A.6), and that school districts should be required to develop and implement an environmental education curriculum plan (Figure A.7). Over 90 % of both principals and directors of curriculum either agreed or strongly agreed that environmental education should be infused into existing curriculum (Figure A.8). There was not much support for the statement that environmental education should be taught as a separate subject (Figure A.9), although principals who work with secondary teachers were more likely to agree to the statement than principals who work with elementary and middle school teachers (Figure A.10). Finally, when asked to identify personal barriers which prevent them from including or increasing environmental education in their school or school district, close to 60 % of both the principals and directors of curriculum indicated they harbored no personal barriers but they also indicated time was a particular concern. Only 11 % of the principals and 8 % of the directors of curriculum indicated they do not have the personal interest in including or increasing environmental education in their school (Figure A.11).

Figure A.1 Schools should build student awareness and sensitivity to the total (human and natural) environment and its associated problems.

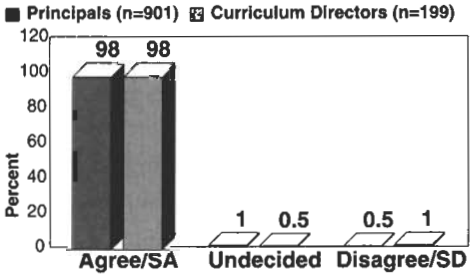


Figure A.2 Schools should provide opportunities for students to acquire a basic knowledge and understanding of the environment and our human relationship to (it).

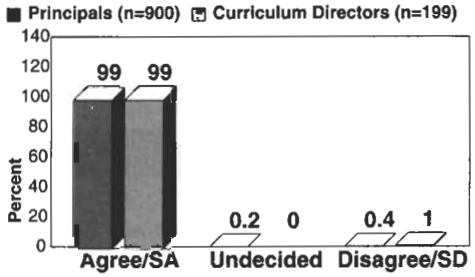


Figure A.3 Schools should provide opportunities for students to develop attitudes and feelings of concern for the environment.

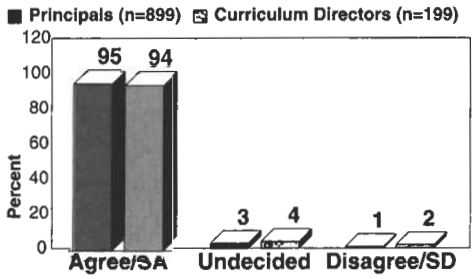


Figure A.4 Schools should provide opportunities for students to develop skills ... (relating to) the resolution of environmental issues and problems.

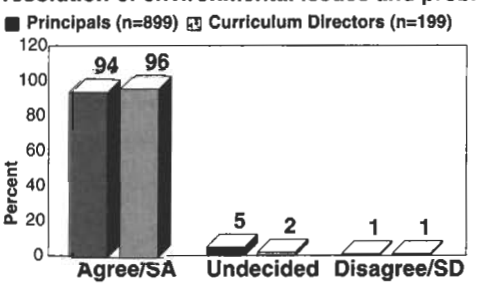


Figure A.5 Schools should provide opportunities for students to gain actual experience in resolving environmental issues.

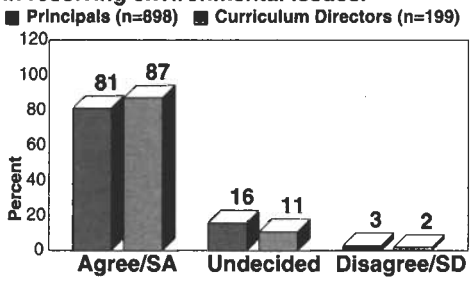


Figure A.6 Environmental education should be considered a priority in our K-12 educational system.

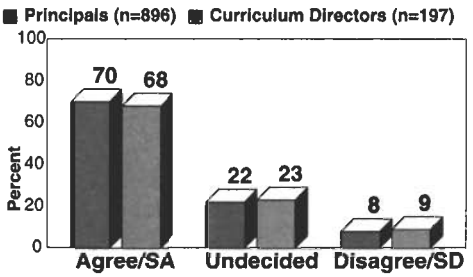


Figure A.7 It is important that school districts be required to develop and implement an EE curriculum plan.

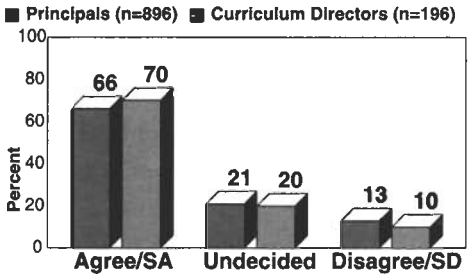


Figure A.8 Education about the environment should be infused into the existing curricula in my school.

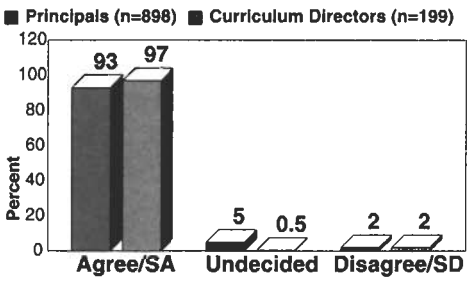


Figure A.9 Education about the environment should be taught as a separate subject in my school.

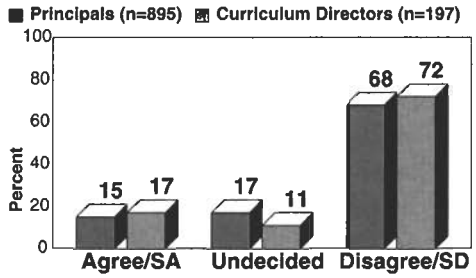


Figure A.10 Education about the environment should be taught as a separate subject in my school (n = 833)
(Principals, grouped by grade level of teacher population work with most)

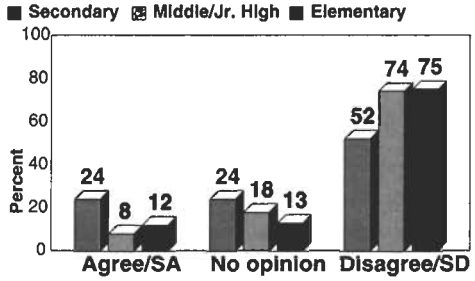
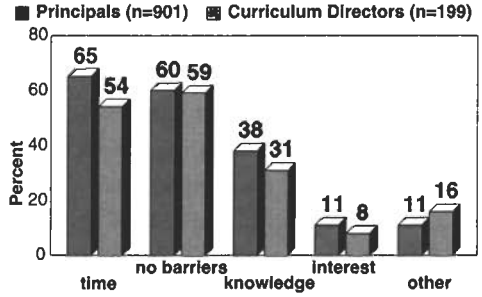


Figure A.11 Personal barriers to including or increasing environmental education.
(note: respondents could select more than one response)



To what degree are school administrators personally knowledgeable about EE and aware of the status of EE in their schools?

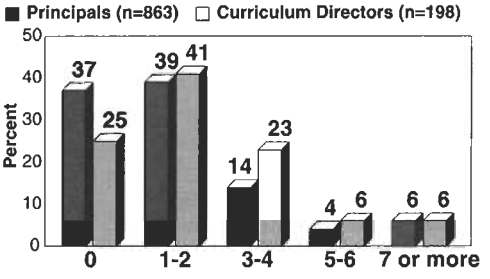
School administrators, as a group, might best be described as having an "awareness" and "some training" in EE; however, the scope and depth of their experience remains hard to determine.

When asked to estimate the number of environmental education courses, workshops or in-services they have attended, over 75 % of the school administrators reported having had at least one

course in environmental education (Appendix D, item #4). However, 41 % of the principals and 48 % of the directors of curriculum reported having attended one to two in-services, courses or workshops in environmental education and 23 % of the principals and 20 % of the directors of curriculum indicated they have not attended any courses or workshops in environmental education. Although it is encouraging that most school administrators have had some training in environmental education, this finding does not give an indication of the quality of the environmental education training. No parameters were established for the word "attended" and no specific definitions were given for "environmental education courses, workshops, or in-services." While some respondents may have interpreted this question as relevant to their college courses in biology or a one hour workshop on environmental education at a professional conference, others may have felt they had attended an environmental education in-service if they observed some of the activities during a staff meeting.

Approximately a third of the school administrators in each population indicated they did not have the knowledge or background to feel comfortable promoting environmental education (Figure A.11). This finding is of special concern in the case of directors of curriculum, who are supposed to provide curriculum leadership in the area of environmental education, yet may not feel they have adequate training to do so effectively. This study also found that school administrators with less than 3 years of experience appear to have attended approximately the same or more environmental education courses, workshops or in-services than their peers with 3-10 years of experience. Several possible conclusions can be drawn from this information. It may be that pre-service school administrators are receiving more training in environmental education than their peers did more than 3 years ago. There are no direct requirements for environmental education to be included in pre-service training for school administrators, but school administrators are required to have a teaching certificate and since 1985 individuals applying for a teaching license in certain areas must demonstrate competencies in environmental education. Another explanation may be a result of a greater interest in the environment and environmental education since 1990. The increase in public attention may have generated a greater interest on the part of school administrators in obtaining training in environmental education. Indeed, over 60 % of both the principals and directors of curriculum indicated their school or school district has offered at least 1-2 environmental education courses/in-services in the past 3 years (Figure A.12).

Figure A.12 Number of environmental education in-services offered for teachers in the past three years (by school or school district).



Administrators also reported that the infusion of EE is not a planned practice in all schools. Over 40 % of the principals and 20 % of the directors of curriculum report that their district does not have a written curriculum plan for environmental education (Figure A.13). Of those districts that have EE plans, 39 % of the principals and 49 % of the curriculum directors were either dissatisfied with the plan or unsure of how they felt about the plan (Figure A.14).

Figure A.13 Does your school have a written curriculum plan for environmental education?

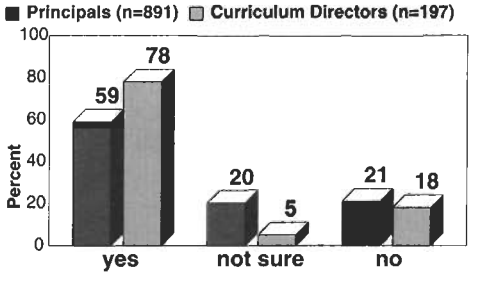
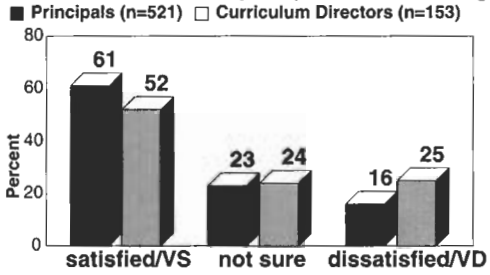


Figure A.14 Degree of school adminstrator satisfaction with the implementation of their district's environmental education curriculum plan (% of those having a plan).



To what extent do administrators perceive that they provide administrative support for EE in their schools?

School administrators do take actions to support environmental education, however, the majority of actions might be described as passive.

Both principals and directors of curriculum reported on the extent to which they support environmental education in their school or district through their personal actions. Results suggest that although both populations take action to support environmental education, most of the actions require relatively limited time commitment on the part of the school administrator. A majority of the principals and directors of curriculum reported they distribute environmental education information, give encouragement to teachers for their efforts to teach about the environment, and support or authorize teacher requests to attend environmental education workshops outside of district-sponsored in-services. School administrators were less likely to report spending much time writing grants, making arrangements for staff training or in-services in environmental education or making arrangements or requests for resources and materials needed for environmental education programs or projects (Appendix D, Section III). The majority of the administrators (65 % of the principals and 54 % of the directors of curriculum) indicated they do not have the time to promote environmental education (Figure A.11).

An interesting finding, however, was that principals with more experience in environmental education show a higher degree of support for environmental education than administrators who have not attended any courses, in-services or workshops in environmental education (Appendix J).

When asked to estimate the amount of money in the school budget allocated specifically for environmental education (excluding personnel costs), 38 % of the principals reported that their school does not specifically fund environmental education and an additional 34 % indicated their school allocates less than $500 (Table A.1). Some principals, however, wrote on their survey that the budget for environmental education was infused into the budgets for other subject areas and not considered a separate line item.

Table A.1 Principals' estimation of the amount of money in their school budgets specifically for environmental education (n =798*)

Response option	(n)	(%)
Not funded	306	38
$ 1 - $250	135	17
$ 251 - $500	139	17
$ 501 - $1000	102	13
$1001 - $1500	40	5
$1501 - $2000	16	2
Over $2000	60	8

*103 principals did not give a response to this item

Personnel support in the schools for environmental education is very limited if available at all. Over 50 % of the principals reported their school has no one designated as the environmental education specialist, coordinator, or chairperson (Figure A.15), and the majority of the principals and curriculum coordinators reported that their school/district does not have an active environmental education committee (Figure A.16). Of those schools that do have a person designated to work with environmental education, over 55 % of the principals described the position as voluntary with no release time (Table A.2). Less than half of the schools/districts with active environmental education committees provide committee members with release time and/or financial support (Figures A.17, A.18).

Figure A.15 Does your school have a person designated as the environmental education specialist, coordinator, or chairperson?

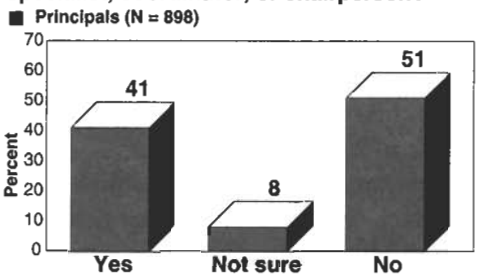


Figure A.16 Does your school/district have an active environmental education committee?

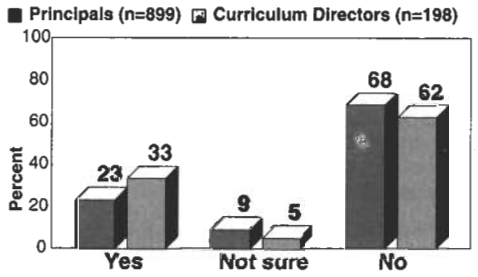


Table A.2 Principals' description of school environmental education specialist (n =364)

Position description	(n)	(%)
Full time, paid position	32	9
Part time, paid postion	70	19
Voluntary postion with release time	62	17
Voluntary positioin with no release time	200	55

Figure A.17 Does your school/district provide 'release time' for the environmental education committee to meet?
(percent of those reporting having an EE committee)

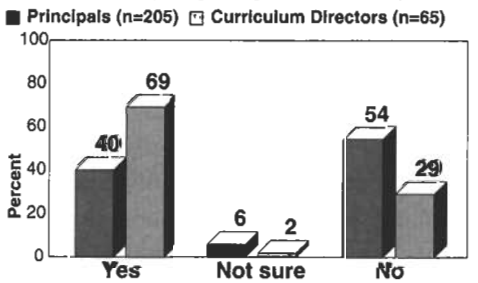
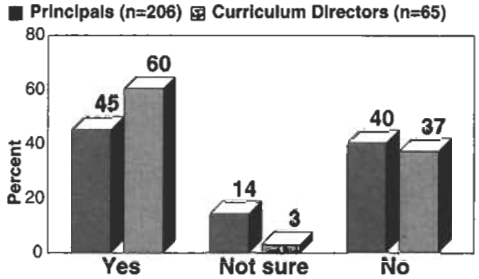


Figure A.18 Does your school/district provide financial support for the environmental education committee to mee
(percent of those reporting having an EE committee)



What do school administrators identify as barriers to offering EE in the schools?

Lack of funding and time were consistently reported among the top barriers to environmental education by principals and directors of curriculum (Figures A.19, A.20). Both principals and directors of curriculum indicated there was not enough funding at both the school and district levels. The kind of funding, the amount of funding needed, and the purpose for the funding were not specified in this study. Administrators may feel more funding is needed to hire personnel, cover the costs of additional teacher in-services, pay for field trips, or purchase equipment to be used for environmental education. Administrators reported that they personally did not have the time to promote environmental education (Figure A.11). Although they overwhelmingly indicated that environmental education should be infused into the curriculum, close to 50 % of both populations of administrators believe that there is not enough class time (Figure A.19). One principal commented on his/her survey: "You can't put 10 lbs. of potatoes in a 5 lb. bag, unless you mash them."

Figure A.19 School-related barriers to including or increasing environmental education in school or district.
(Each respondent ranked top 3; top 4 ranked out of 13 choices are shown.)

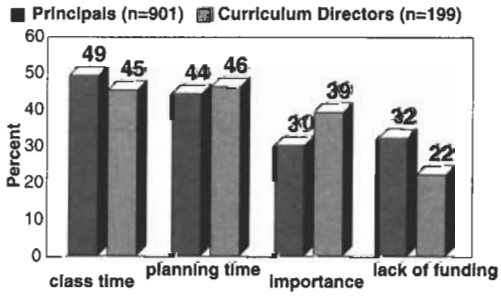
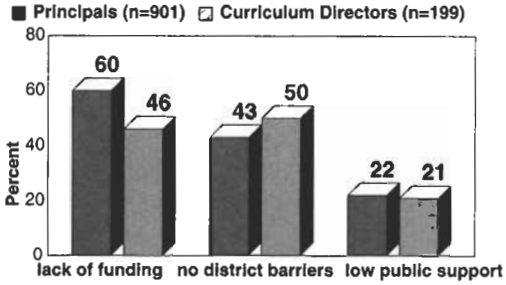


Figure A.20 District-related barriers to including or increasing environmental education in school or district
(Each respondent ranked top 3; top 3 ranked out of 8 choices are shown.)

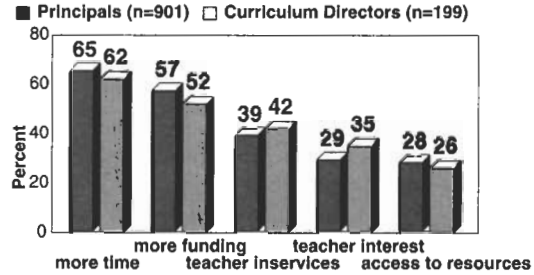


In addition, more than 40 % of the principals and the directors of curriculum believe that teachers do not have enough planning time. Teachers may also feel this is true, but time was not one of the top two reasons indicated by Wisconsin teachers for not infusing environmental concepts into their classroom teaching (see Table T.4 in the previous section of this report). Only 14 % of the teachers reported they did not have enough class time and only 7 % felt they did not have enough planning time. Teachers were more likely to indicate they did not have the knowledge or background to teach about the environment effectively (24%) or that environmental concepts were unrelated to their subject area (25%). However, since teachers were asked to identify only one main barrier, it may be that a perceived lack of time was a secondary barrier.

Over 30 % of the administrators in this study indicated that in their opinion, teachers feel there are things other than EE that are more important to infuse into the classroom. The survey of Wisconsin teachers found this to be true for only 7 % of the teachers who do not infuse environmental concepts into their classroom teaching (Table T.4 in previous section).

This discrepancy between administrators' and teachers' responses suggests that there is a difference of perception as to the barriers to environmental education. Administrators appear to believe environmental education takes extra time and that environmental education is not perceived by teachers as a high priority. Indeed, 29 % of the principals and 35 % of the directors of curriculum indicated more teacher interest in environmental education would encourage them to include or increase environmental education in their school or district (Figure A.21).

Figure A.21 Perceptions of what would most influence administrators to include or increase EE in school/district.
(Each respondent ranked top 3; top 5 ranked out of 10 choices are shown.)



What do school administrators perceive as needs or incentives related to initiating, improving, or increasing EE in their schools?

When asked to identify the top three situations that would most influence them to include or increase environmental education in their school or district, both principals and directors of curriculum identified a need for more time, more funding, and more teacher in-services in environmental education (Figure A.21). They also felt teachers needed to express more of an interest in environmental education. These responses confirmed the perceived barriers that were discussed above.

Summary

The Wisconsin School Administrator Assessment of Environmental Education was conducted to determine what the state's principals and directors of curriculum know, feel, and do about supporting EE in their schools. Findings indicate that the state's school administrators feel education about the environment is important and that school districts should be required to develop and implement environmental education curriculum plans. However, approximately a third of the respondents felt they did not have the knowledge or background to feel comfortable promoting environmental education. School administrators

report they do take actions to support environmental education, however, most actions were considered relatively passive. That is, administrators provide verbal support to the development of EE, but personnel and financial support were relatively lacking in many schools. Implications and strategies related to these findings are presented in Section IV of this document.

This section integrates the findings of the student, teacher, and administrator surveys and tests. It provides implications, conclusions, and strategies relative to improving environmental education in the K-12 schools of Wisconsin.

Importance of Environmental Education

Students believe that learning about the environment and associated issues is relatively important, and they are sincerely interested in receiving K-12 classroom instruction in this area. Further, teachers and administrators overwhelmingly agree that education about the environment should be a priority in K-12 instruction even if it must be implemented through legislative mandates.

Implications: There is significant support to include environmental education as a part of the institutional processes and disciplines that presently comprise K-12 education in Wisconsin. Historically, environmental education (EE) has been treated as a supplemental or peripheral discipline. A more contemporary view held by students, teachers, and administrators seems to place it in line with the core goals of our state's education system.

Conclusion: Schools should evaluate their approach to implementing environmental education. Institutional planning should provide the area of environmental education with comparable financial support, time, and other resources that are allotted to other subjects or educational processes that are considered priorities.

Teachers and administrators believe and expect that environmental education will be a part of pre-service and in-service teacher education programs in Wisconsin.

Implications: Teacher education institutions in Wisconsin will have to concern themselves with providing quality EE in-service and pre-service programs.

Conclusion: The state of Wisconsin, through its teacher education institutions, should accommodate the expectation of pre-service training in environmental education by ensuring that university pre-service programs offer appropriate environmental education course work. In-service programs in environmental education should be made available to educators around the state. Also, appropriate incentives should be offered to teachers who elect to pursue these in-service opportunities. In-services should be designed and offered for teachers from a variety of disciplines (subject areas) and grade levels (K-12). Also, in-services should range from introductory environmental education instruction to advanced leadership opportunities in environmental education.

Implementing Environmental Education

Teachers and administrators in Wisconsin agree that all students should experience environmental education as it relates to appropriate awareness/knowledge, attitudes/values, and behaviors/actions-skills. Further, they believe schools should have K-12 scope and sequence plans for education about the environment.

Implications: Schools planning on implementing environmental education programs should have appropriate scope and sequence objectives (i.e., subject area and grade level objectives) that address identified awareness/knowledge concepts, attitude/value concepts, and behavior/action-skill concepts.

Conclusion: Schools should work to ensure the effectiveness of their environmental education efforts by assessing the degree to which students are achieving the expected awareness/knowledge, attitude/value, and behavior/action skill concepts.

Student Achievement

Ecological knowledge and awareness of environmental issues in the average Wisconsin student is lacking relative to expected educational standards. Higher standards are achievable and desirable.

Implications: It is widely agreed that environmental issues will ultimately be prevented or remedied as a result of the general citizenry pursuing ecologically sound actions or behaviors. Presently, Wisconsin students have limited awareness of existing environmental issues. Further, they are lacking in the ecological knowledge base that would be appropriate to analyzing or understanding the multifaceted nature of environmental concerns. As these students graduate from high school, it seems justifiable to suggest that, as a population, they will be cognitively ill-prepared to deal with the many environmental concerns that plague both the health and economy of this state.

Conclusion: Results of this assessment indicate that students can achieve higher standards as exemplified by the significantly higher scores of students who were self identified and identified by teachers as being environmentally literate. In the future, schools will have to provide environmental education programs that strive to improve upon present ecological knowledge and environmental awareness of the average student population.

Students highly value environmental quality and are sincerely concerned about environmental problems. They believe problems are preventable and solvable. They feel more should be done by government, industry, agriculture, and education. They feel they are personally responsible for contributing to the prevention or solution of environmental problems.

Implications: Students have strong feelings about establishing a societal structure that works toward maintaining environmental quality.

Conclusion: Given that student cognitive scores on this assessment were considered lacking, it's possible that the present student population might be more inclined to make environmental decisions more on how they feel rather than on what they know. Schools should make every attempt to incorporate affective education methods in their environmental education programming. This would allow students the opportunity to analyze their values and beliefs relative to appropriate cognitive information (e.g., ecological and economic information).

Actual involvement of students in pro-environment behaviors or actions is limited or primarily viewed as a "sometimes" occurrence. When students do take actions they are prone to more personal actions such as conserving water, picking up litter, or turning out lights. They are less inclined to pursue nonpersonal actions like encouraging others (e.g., family and friends) to practice pro-environment actions or behaviors. This limited pro-environmental action taking would seem to suggest that students do not view this behavior as an established part of their lifestyles.

Implications: The student assessments clearly indicate that a strong majority of students

expect a societal structure that establishes environmentally responsible behavior across all sectors. Additionally, they feel that they are personally responsible for pursuing environmentally responsible actions. The question then becomes, "Why are they reporting such limited action taking?" The statewide assessments of teachers and administrators indicate that schools are providing limited educational opportunities in understanding or practicing personal or nonpersonal environmental action taking.

Conclusion: If the expectation is that environmentally sound behaviors become a part of this state's social norms, then the schools will have to develop educational programs that more readily help students understand and incorporate pro-environment actions into their lifestyle.

Structural Support

School administrators report they do take actions to support environmental education, however most actions were considered relatively passive. Financial and personnel support specifically for environmental education is mediocre or lacking in many schools.

Implications: Substantial progress in environmental education might be achieved if it was afforded equitable (i.e., to other academic priorities) resource distribution.

Conclusion: Districts could improve their EE programs by identifying environmental education leadership positions (e.g., coordinators or specialists) and/or by establishing an active environmental education committee. These personnel appointments would serve to help promote environmental education, develop curriculum, and evaluate the effectiveness of the programs. Appropriate personnel appointments could be established by directly providing funds for positions or, more realistically, by providing appropriate release time. The establishment of these positions also sends a message to teachers that this is an important curriculum area and deserving of their attention.

Despite a mandate that environmental education be included in all school district curriculum plans by 1990, not all schools have provided such a plan. Of those that do have an environmental education curriculum plan, a fair number of administrators are "not sure" or "dissatisfied" with the quality of implementation.

Implications: Obviously, if a school has no environmental education curriculum plan, or if it lacks the appropriate personnel to implement it, there is limited chance that students are experiencing a quality environmental education program.

Conclusion: Correlation results from the teachers' assessment indicate that teachers in districts with active environmental education curriculum plans spend more time infusing environmental education. Additionally, teachers using plans are relatively more confident and comfortable with infusing environmental education.

Teacher pre-service and in-service experience are a factor that seems to impinge on the amount and type of environmental education offered by teachers in the state.

Implications: Teachers who have experienced in-service or pre-service environmental education report spending more time at infusing environmental education into the classroom. Additionally, they report feeling more confident and comfortable with infusing environmental education into the classroom.

Conclusion: Many teachers (more than 50%) who should have received pre-service environmental education report not receiving it. It's possible that teachers received it and do not remember it (i.e., little or no impact) or their teacher education institution did not offer an EE experience. Obviously, teachers who have little or no environmental education training are not as likely to offer a quality environmental education experience to students as those who have had an appropriate EE pre-service experience.

Many school districts (25-40%) have not offered any environmental education in-services, workshops, or courses in their district. Thus, teachers are having to seek out programs on their own or do without. The majority of teachers in Wisconsin hold pre-1985 (i.e., when the pre-service EE mandate became effective) certification, meaning they probably did not have an opportunity to experience pre-service training in EE. Thus, there are a substantial number of practicing teachers who have had no formal training in what environmental education is, how to offer it, or how to evaluate it. Students experiencing classes with these teachers are probably less likely to do well on environmental education achievement than those who experience classes with teachers that have had appropriate EE experiences.

Summary

In general, Wisconsin has a K-12 educational atmosphere that is very supportive of developing and improving environmental education. Wisconsin mandates in EE seem to be effective, given that teachers are more active in providing environmental education if they had pre-service training in EE and/or if they are working in a district with an EE curriculum plan. There is however substantial room for continued improvement which is validated by the questionable achievement of students on the environmental literacy assessments. Additionally, there are a fair number of schools and teachers which admittedly are not offering appropriate environmental education to their students. Wisconsin will have to work on improving the quality of environmental education where it is presently provided and to initiate quality EE where it is not being provided and should be. The following strategies have been identified as possible avenues to improving environmental education in Wisconsin schools.

Strategies for Improvement

Student environmental literacy can and should be improved. Mechanisms suggested for doing this are presented in the following recommendations.

1) Provide clarification on what constitutes an effective K-12 environmental education program.

Establish content and performance standards for environmental education.

Establish K-12 scope and sequence plans for environmental education based on appropriate frameworks for ecology, water resources, air resources, soil resources, energy resources, biodiversity, environmental economics, resource management, environmental health, and citizen participation.

2) School districts should be provided with incentives to further establish environmental education as part of the core curriculum offered by schools. Environmental education should no longer be viewed as supplementary.

Establish environmental literacy standards for students in the state.

Incorporate environmental literacy into achievement testing.

Continue to improve the infusion of environmental education into elementary school curricula.

Recognize environmental studies/science as a core part of high school science and/or social studies requirements.

Recognize high school environmental studies/science credits toward the UW system's freshman entrance requirements.

3) Continue to improve K-12 teacher in-service, pre-service, and leadership programs.

In-service on environmental education should be continuous and should support the institution of the district environmental education scope and sequence plan.

University and college pre-service EE programs should be evaluated by environmental educators so as to establish, validate, or improve pre-service teacher training in environmental education.

Provide for advanced degree programs in environmental education for teachers and establish appropriate incentives to pursue these programs (e.g. pay scale recognition, position status equitable relative to other disciplines, scholarships, stipends)

4) School districts must be encouraged to provide equitable (relative to other disciplines) resources and personnel allocation to environmental education.

Hire teachers appropriately trained to practice environmental education and provide leadership in the development and evaluation of environmental education.

Establish school or district curriculum committees to work on the development and evaluation of environmental education programs.

Establish a consistent, comprehensive environmental literacy testing program (e.g., objective and performance based assessments).

Establish an on-going environmental education in-service program.

Provide teachers with access to appropriate environmental education materials.

Dunlap, R. E., Gallup, G. H., and Gallup, A. M. (1992). The Health of the Planet. George H. Gallup International Institute.

Engleson, D. C. and Yockers, D. H. (1994). A Guide to Curriculum Planning in Environmental Education. Madison: Wisconsin Department of Public Instruction.

Iozzi, L., Laveault, D., and Marcinkowski, T. (1990). Assessment of Learning Outcomes in Environmental Education. (draft copy) Paris, France: UNESCO.

Lane, J. (1993). An Assessment of Wisconsin Teachers' Perceived Competencies In, Attitudes Toward, and Amount of Class Time Devoted to Teaching About the Environment. Unpublished Master's thesis. Stevens Point: University of Wisconsin.

Lane, J., Wilke, R., Champeau, R., and Sivek, D. (1996). Wisconsin EE Mandates: The Bad News and the Good News. Journal of Environmental Education, 27(2), 33-39.

Lane, J., Wilke, R., Champeau, R., and Sivek, D. (1994). Environmental Education in Wisconsin: A Teacher Survey. Journal of Environmental Education, 25(4), 9-17.

Peri, P. (1996). The Development of an Instrument to Assess Environmental Literacy of Eleventh Grade Students in Wisconsin. Unpublished Master's thesis. Stevens Point: University of Wisconsin.

Quale, A. (1993). Development of an Instrument to Assess the Environmental Literacy of Wisconsin Fifth Grade Students. Unpublished Master's thesis. Stevens Point: University of Wisconsin.

Roper Organization Inc. (1992). Natural Resources Conservation: Where Environmentalism is Headed in the 1990s. Time Mirror Magazines National Environmental Forum Survey.

Roper Organization Inc. (1995). Attitudes on Actions Toward Sustainable Development; Face to Face Interviews with 1002 Adults. Commissioned by S.C. Johnson & Son, Inc.

Rossow, C. E. (1994). An Assessment of School Administrators Knowledge of, Attitudes Towards, and Degree of Support for Environmental Education in Wisconsin Public Schools. Unpublished Master's thesis. Stevens Point: University of Wisconsin.

Ruskey, A., and Wilke, R. (1994). Promoting Environmental Education: An Action Handbook for Strengthening Environmental Education in Your State and Community. University of Wisconsin-Stevens Point Foundation Press.

Summary of Response Frequencies
1994 Environmental Survey of Wisconsin's Fifth Grade Students

Part One

(Editor note: The questions in Part One were used to develop a student profile.)

Instructions for Part One: Fill in the circle on your answer sheet for the letter of the answer that is most like your answer to each of the following questions.

Key :

N = Total Sample Population

EL = Students Identified as Environmentally Literate (teacher id'd or self id'd from # 3, choice a)

NI = Students Not Identified as Environmentally Literate (not id'd by either teacher or self)

1. What is your gender? (N = 1850, EL = 678, NI = 1172)

%TP	%EL	%NI	
49	47	51	a) female
51	53	49	b) male

2. Compared to other subjects you study, how do you feel about studying environmental topics? (N = 1851, EL = 678, NI = 1173)

%TP	%EL	%NI	
15	13	17	a) less interested
52	49	54	b) about the same
33	38	30	c) more interested

3. Compared with other students your age, how well do you think you understand problems related to the environment? (N = 1850, EL = 678, NI = 1172)

%TP	%EL	%NI	
22	60		a) above average
71	38	90	b) average
7	2	10	c) below average

4. What one thing has contributed most to your understanding of the environment and environmental problems? (choose only one answer) (N = 1852, EL = 677, NI = 1175)

%TP	%EL	%NI	
28	24	31	a) school
15	18	14	b) books, newspapers, or magazines I have read on my own.
10	10	10	c) friends or family members (including parents)
26	24	26	d) field trips, special programs or activities such as clubs, scouting or 4H
21	23	19	e) television programs

(Editor note: The questions in Part Two were used to develop an affective profile. Items 5-18 measured student attitudes towards the environment. Items 19-26 measured student locus of control and degree of assumption of personal responsibility towards the environment.)

Instructions for Part Two: These questions ask what you think. Be honest. There are no right or wrong answers. Read each question carefully. Fill in the circle on your answer sheet that is closest to what you think.

Strongly Agree (SA) (a)	Agree (A) (b)	No opinion (N) (c)	Disagree (D) (d)	Strongly Disagree (SD) (e)

5. More money should be spent solving environmental problems.
(N =1850, EL = 679, NI =1171)

	SA	A	N	D	SD
%TP	31	37	24	4	3
%EL	38	36	19	3	3
%NI	27	38	27	4	3

6. I want to spend more time learning about the environment.
(N = 1854, EL = 679, NI = 1175)

	SA	A	N	D	SD
%TP	18	35	32	10	4
%EL	25	34	29	9	4
%NI	15	36	35	11	5

7. More money should be spent teaching people about the environment and its problems.
(N = 1850, EL = 678, NI = 1172)

	SA	A	N	D	SD
%TP	18	32	34	12	4
%EL	21	34	30	10	5
%NI	16	31	36	14	4

8. My school should have more lessons about the environment.
(N = 1852, EL = 678, NI = 1174)

	SA	A	N	D	SD
%TP	19	35	28	12	6
%EL	25	33	25	11	6
%NI	16	36	30	12	6

9. I would be interested in joining a club that tries to protect the environment.
(N = 1851, EL = 678, NI = 1173)

	SA	A	N	D	SD
%TP	28	30	25	12	6
%EL	34	27	21	10	7
%NI	24	31	27	13	5

10. I would be willing to change my habits if it helped solve pollution problems. (N=1852, EL = 678, NI = 1174)

	SA	A	N	D	SD
%TP	33	38	23	4	2
%EL	37	38	21	3	2
%NI	31	38	24	5	3

11. If a car makes too much air pollution no one should be allowed to drive it. (N = 1850, EL = 677, NI = 1173)

	SA	A	N	D	SD
%TP	19	18	27	20	15
%EL	18	20	29	18	15
%NI	19	18	26	22	15

12. How I travel to school each day is important because my energy use affects the environment. (N = 1849, EL = 678, NI = 1171)

	SA	A	N	D	SD
%TP	19	30	35	8	8
%EL	22	31	33	7	7
%NI	17	30	36	9	8

13. It is okay if a little water gets polluted because there is plenty of water. (N = 1839, EL = 675, NI = 1164)

	SA	A	N	D	SD
%TP	3	8	11	30	48
%EL	3	6	7	30	54
%NI	4	9	12	30	45

14. It is okay for our school to make the playground larger, even if it means destroying some endangered plants. (N = 1852, EL = 678, NI = 1174)

	SA	A	N	D	SD
%TP	5	3	9	23	59
%EL	5	2	7	20	66
%NI	5	4	11	25	56

15. The government should encourage people to have cars that are energy efficient. (N = 1852, EL = 678, NI = 1174)

	SA	A	N	D	SD
%TP	35	28	28	5	4
%EL	44	27	20	3	5
%NI	30	28	32	6	4

16. To save energy, I am willing to watch one hour less of television per day. (N = 1848, EL = 677, NI = 1171)

	SA	A	N	D	SD
%TP	18	28	26	11	17
%EL	23	28	25	10	14
%NI	15	29	26	11	18

17. I am concerned about how large the human population is becoming.
(N = 1844, EL = 676, NI = 1168)

	SA	A	N	D	SD
%TP	18	23	43	10	6
%EL	22	23	40	9	6
%NI	15	23	45	10	6

18. It bothers me to throw an aluminum can in the trash. (N = 1848, EL = 675, NI = 1173)

	SA	A	N	D	SD
%TP	22	27	30	12	9
%EL	28	27	28	10	8
%NI	19	26	31	14	10

19. It is a waste of time to work to solve environmental problems.
(N = 1832, EL = 674, NI = 1158)

	SA	A	N	D	SD
%TP	4	4	13	23	55
%EL	4	4	16	19	63
%NI	4	5	15	26	51

20. When I have done something that harms the environment there's very little I can do to make it right. (N = 1844, EL = 676, NI = 1168)

	SA	A	N	D	SD
%TP	7	14	25	31	23
%EL	8	11	21	32	29
%NI	7	15	28	30	20

21. Things I do have no effect on the quality of the environment.
(N = 1852, EL = 677, NI = 1175)

	SA	A	N	D	SD
%TP	4	9	26	31	30
%EL	5	7	20	30	38
%NI	4	10	28	32	25

22. Most of the time an adult or my parents(s) will listen to what I have to say about the environment. (N = 1850, EL = 679, NI = 1171)

	SA	A	N	D	SD
%TP	18	32	29	12	11
%EL	22	31	26	10	11
%NI	15	32	30	13	11

23. I don't worry about turning out the lights in an empty classroom because the school pays for the electricity. (N = 1852, EL = 679, NI = 1173)

	SA	A	N	D	SD
%TP	8	7	18	29	38
%EL	7	5	15	29	43
%NI	8	8	19	30	36

24. It is too hard to solve environmental problems. (N = 1847, EL = 677, NI = 1170)

	SA	A	N	D	SD
%TP	7	9	23	32	30
%EL	7	8	19	32	35
%NI	7	9	25	32	26

25. As long as other people are driving big cars, my family should be able to drive one too. (N = 1853, EL = 678, NI = 1175)

	SA	A	N	D	SD
%TP	9	11	33	25	22
%EL	8	9	32	25	26
%NI	10	12	34	26	19

26. Environmental problems will only be solved when people like me change the way we live. (N = 1854, EL = 679, NI = 1175)

	SA	A	N	D	SD
%TP	36	26	23	9	6
%EL	41	26	19	7	7
%NI	33	26	25	9	6

Part Three

(Editor note: The questions in Part Three were used to develop a behavioral profile.)

Instructions for Part Three: The next questions ask about things you do. Be honest. There are no right or wrong answers. Fill in the circle on your answer sheet that is closest to what you do.

Almost Always (AA)	Often (O)	Sometimes (S)	Almost Never (AN)	Never (N)
(a)	(b)	(c)	(d)	(e)

27. I try to save water. (N = 1853, EL = 679, NI = 1174)

	AA	O	S	AN	N
%TP	32	34	28	4	3
%EL	35	35	25	3	2
%NI	30	33	30	4	3

28. I turn off lights without being asked. (N = 1849, EL = 679, NI = 1170)

	AA	O	S	AN	N
%TP	38	28	26	4	3
%EL	42	25	26	4	3
%NI	35	30	27	4	4

29. I turn the water off while brushing my teeth. (N = 1850, EL = 678, NI = 1172)

	AA	O	S	AN	N
%TP	59	15	14	5	7
%EL	66	11	13	4	5
%NI	54	17	14	6	8

30. I try to eat at places that use little packaging. (N = 1850, EL = 678, NI = 1172)

	AA	O	S	AN	N
%TP	9	12	38	20	21
%EL	12	13	36	19	21
%NI	7	12	39	20	22

31. I tell people about using recycled paper. (N = 1850, EL = 677, NI = 1173)

	AA	O	S	AN	N
%TP	10	13	26	20	30
%EL	12	14	27	20	27
%NI	8	12	26	20	33

32. I have written a letter to someone suggesting a solution to an environmental problem. (N = 1849, EL = 678, NI = 1171)

	AA	O	S	AN	N
%TP	4	4	12	10	70
%EL	6	5	14	10	65
%NI	2	3	12	11	72

33. I ask people to recycle. (N = 1848, EL = 677, NI = 1171)

	AA	O	S	AN	N
%TP	15	18	30	17	20
%EL	20	22	28	14	16
%NI	13	16	31	18	22

34. I ask someone not to buy something if I think it harms the environment. (N = 1849, EL = 678, NI = 1171)

	AA	O	S	AN	N
%TP	8	9	24	21	38
%EL	11	11	24	20	34
%NI	5	8	24	22	41

35. I ask someone to buy recycled paper. (N = 1848, EL = 676, NI = 1172)

	AA	O	S	AN	N
%TP	8	11	21	20	40
%EL	11	12	21	21	35
%NI	6	10	22	20	43

36. I ask people not to litter. (N = 1849, EL = 679, NI = 1170)

	AA	O	S	AN	N
%TP	26	25	25	12	12
%EL	32	26	22	10	10
%NI	23	25	26	14	12

37. I ask other people to do some things because they are good for the environment. (N = 1848, EL = 677, NI = 1171)

	AA	O	S	AN	N
%TP	12	22	34	17	16
%EL	16	24	31	14	15
%NI	9	20	36	18	16

38. I have encouraged a parent or another adult to vote. (N = 1852, EL = 679, NI = 1173)

	AA	O	S	AN	N
%TP	13	16	20	13	37
%EL	17	18	20	12	33
%NI	11	15	21	14	40

39. I pick up litter without being asked. (N = 1852, EL = 678, NI = 1174)

	AA	O	S	AN	N
%TP	25	24	33	10	8
%EL	31	27	27	9	6
%NI	21	23	36	10	10

40. I try to save electricity. (N = 1851, EL = 678, NI = 1173)

	AA	O	S	AN	N
%TP	36	31	23	6	4
%EL	41	30	20	5	4
%NI	33	31	25	6	4

Part Four

(Editor note: The questions in Part Four were used to develop a cognitive profile.)

Instructions for Part Four: These questions ask about what you know. Read each question carefully. Fill in the circle representing the best answer on your answer sheet.

41. A flower with colorful petals and a sweet smell would most likely be pollinated by: (N = 1840, EL = 672, NI = 1168)

%TP	%EL	%NI		
14	11	15	a)	rain.
5	4	6	b)	wind.
17	15	18	c)	a gardener.
65	70	62	d)*	insects.

42. A small bird eats a butterfly that had been eating nectar from a flower. Then the bird is eaten by a hawk. This is an example of: (N = 1849, EL = 677, NI = 1172)

%TP	%EL	%NI		
2	2	3	a)	mutualism.
92	94	92	b)*	a food chain.
2	2	2	c)	competition.
3	3	3	d)	survival of the fittest.

43. Which of the following is a predator-prey relationship? (N = 1848, EL = 678, NI = 1170)

%TP	%EL	%NI		
12	9	14	a)	A flea bites a dog.
70	76	66	b)*	A robin eats a worm.
8	6	9	c)	A caterpillar eats a leaf.
11	9	11	d)	A deer eats grass that has a grasshopper on it.

44. A fox dies. This creates a problem for: (N = 1846, EL = 676 , NI = 1170)

%TP	%EL	%NI		
42	50	37	a)*	the fleas that were drinking the fox's blood.
11	11	11	b)	a rabbit that has a nest nearby.
17	14	19	c)	another fox whose territory is nearby.
30	26	33	d)	an animal that hunts in the same area that the fox did.

45. Termites eat only wood; however, they cannot digest it. Tiny organisms that only live in termites' stomach and intestine digest the wood. The relationship the tiny organisms and the termites have is helpful to: (N = 1840, EL = 673, NI = 1167)

%TP	%EL	%NI		
48	53	45	a)*	both.
15	12	17	b)	one and harmful to the other.
22	21	22	c)	one and has no effect on the other.
15	14	16	d)	neither.

46. A cat and a snake are hunting the same mouse. What is the relationship between the cat and the snake? (N = 1844, EL = 674, NI = 1170)

%TP	%EL	%NI		
12	9	13	a)	One is using the other but not harming it.
71	78	67	b)*	They are competing with each other.
10	7	11	c)	They are helping each other.
8	5	9	d)	One is trying to eat the other one.

47. If there were no decomposers on Earth, what would happen?
(N = 1844, EL = 676, NI 1168)

%TP	%EL	%NI		
60	66	57	a)*	Dead plants and animals wouldn't become part of the soil.
12	10	13	b)	Many human diseases would disappear.
7	7	7	c)	More meat would be available for humans to eat.
20	17	22	d)	Little would change.

48. A grassland turns into a desert over a short period of time. What will most likely happen to the animals that lived in the grassland? (N = 1850, EL = 677, NI = 1173)

%TP	%EL	%NI		
84	88	82	a)*	Most will leave or die.
3	2	3	b)	They would have more babies to survive.
7	5	8	c)	Those that eat grass would adapt to new food.
6	5	7	d)	Many will pass on traits that will help their young to survive in the desert.

49. Some people started a program in a national forest to protect deer. They started killing wolves. Ten years later there were no wolves in the forest. For a few years after the wolves were gone there were many more deer than there had ever been. Then suddenly there were almost no deer.

The people who wanted to protect the deer didn't know that:
(N = 1844, EL = 677, NI = 1167)

%TP	%EL	%NI		
19	16	22	a)	deer only live to be a few years old.
12	9	13	b)	fires would kill so many deer.
23	22	23	c)	other animals would eat so much of the deer's food.
46	54	42	d)*	the deer would eat all of the food and then many would starve.

50. The original source of energy for almost all living things is:
(N = 1840, EL = 677, NI = 1163)

%TP	%EL	%NI		
50	56	47	a)*	the sun.
36	33	37	b)	water.
4	4	5	c)	the soil.
9	7	11	d)	plants.

51. A rabbit eats some corn. The energy from the corn goes into the rabbit. The next day a fox eats the rabbit. The fox gets very little of the energy that was in the corn. Why? (N = 1846, EL = 677, NI = 1169)

%TP	%EL	%NI		
4	4	4	a)	A fox can't digest corn.
34	33	35	b)	The rabbit has already digested the corn.
6	4	7	c)	Corn doesn't have much energy.
56	59	54	d)*	Most of the corn's energy was used by the rabbit.

52. Most of the oxygen in the atmosphere comes from: (N = 1842, EL = 673, NI = 1169)

%TP	%EL	%NI		
2	2	2	a)	insects.
76	83	72	b)*	plants.
7	5	8	c)	the soil.
14	10	17	d)	the sun.

53. Which of the following would give humans the most food energy from 1,000 pounds of plants? Assume the plants are good for people to eat. (N = 1844, EL = 674, NI = 1170)

%TP	%EL	%NI		
19	18	20	a)	Feed the plants to insects, feed the insects to fish, then humans eat the fish.
38	42	36	b)*	Humans eat the plants.
33	33	33	c)	Feed the plants to cattle then humans eat the cattle.
9	7	11	d)	Feed the plants to fish then humans eat the fish.

54. After living things die they decompose. As a result of this process nutrients are: (N = 1843, EL = 677, NI = 1166)

%TP	%EL	%NI		
52	65	45	a)*	recycled.
19	12	23	b)	destroyed.
9	7	10	c)	unavailable.
19	16	22	d)	evaporated.

55. Which of the following is a part of the water cycle? (N = 1842, EL = 674, NI = 1168)

%TP	%EL	%NI		
7	6	8	a)	Erosion.
22	16	25	b)	Ocean tides.
66	74	61	c)*	Evaporation.
5	4	6	d)	Decomposition.

56. A pollutant gets into an ecosystem and harms insects. How might this affect the ecosystem? (N = 1831, EL = 672, NI = 1159)

%TP	%EL	%NI		
8	5	9	a)	Plants are not harmed, so it doesn't affect the ecosystem.
55	62	50	b)*	It harms part of the ecosystem, so it may affect other parts of the ecosystem.
20	17	22	c)	It kills insects, so other animals in the ecosystem stay healthy.
17	15	18	d)	Most animals eat plants so it doesn't affect the ecosystem much.

57. Many people believe that the Earth's average temperature is changing. They say that one important cause of this change is: (N = 1838, EL = 673, NI = 1165)

%TP	%EL	%NI		
35	39	32	a)*	using fuels like gasoline.
35	33	36	b)	the sun is moving closer to the earth.
20	19	20	c)	acid rain.
10	9	11	d)	rising ocean levels.

58. The layer of ozone in the Earth's atmosphere has developed holes because: (N = 1839, EL = 674, NI = 1165)

%TP	%EL	%NI		
64	72	60	a)*	some kinds of air pollution break down ozone.
10	8	11	b)	the sun's rays have become more powerful.
10	5	13	c)	the Earth's average temperature is changing.
15	15	16	d)	acid rain is breaking down ozone.

59. Acid rain is a problem because: (N = 1834, EL = 673, NI = 1161)

%TP	%EL	%NI		
57	62	54	a)*	it may harm plants by affecting their leaves and changing the soil they grow in.
18	17	19	b)	it may break down the layer of ozone in the Earth's atmosphere.
10	9	11	c)	people may have to stay indoors when it's raining.
14	13	15	d)	it may cause a slow change in the Earth's temperature.

60. One suggested advantage of using nuclear power plants instead of coal or oil for energy production is: (N = 1824, EL = 664, NI = 1160)

%TP	%EL	%NI		
15	10	17	a)	Nuclear power plants are not expensive to build.
18	17	19	b)	The waste products are easy to store.
10	8	11	c)	They are totally safe.
57	64	53	d)*	There is less air pollution.

61. Which of the following would be most likely to cause soil pollution?
(N = 1847, EL = 676, NI = 1171)

%TP	%EL	%NI		
51	55	48	a)*	Putting too much fertilizer on lawns.
17	16	17	b)	Organic gardening.
13	9	15	c)	Letting dead plants become part of the soil.
20	20	20	d)	Cutting lawns so short that the grass dies.

62. Landfills may contribute to groundwater pollution when: (N = 1844, EL = 676, NI = 1168)

%TP	%EL	%NI		
18	16	19	a)	people put things that could be recycled in the garbage.
59	67	55	b)*	chemicals leak out of the landfill.
11	9	13	c)	it rains.
11	9	13	d)	people put biodegradable materials into the garbage.

63. The pollution of ocean water is a serious problem because:
(N = 1842, EL = 675, NI = 1167)

%TP	%EL	%NI		
10	8	11	a)	ships have trouble traveling through polluted water.
6	4	7	b)	the oceans contain salt water.
8	5	10	c)	ocean tides are affected.
76	82	72	d)*	oceans contain many different kinds of plants and animal life.

64. A polluted river: (N = 1841, EL = 672, NI = 1169)

%TP	%EL	%NI		
3	2	4	a)	is easy to clean up.
21	17	24	b)	will always be polluted if it runs through large cities.
67	72	64	c)*	can be cleaned up with a great deal of work and cooperation by many people.
8	9	8	d)	is the responsibility of only the people living and working near its banks.

65. Keeping oceans unpolluted is made harder by the: (N = 1839, EL = 672, NI = 1167)

%TP	%EL	%NI		
16	14	18	a)	salt in ocean water.
20	18	21	b)	wide variety of plants and animals living in the oceans.
12	11	12	c)	wide variety of temperatures and weather that the oceans have.
52	57	48	d)*	number of countries that use the oceans.

66. Cutting down forests for lumber or farming often conflicts with:
(N = 1845, EL = 674, NI = 1171)

%TP	%EL	%NI		
8	8	8	a)	creating jobs.
18	16	20	b)	building homes for people.
65	68	63	c)*	the needs of forest plants and animals.
8	8	8	d)	keeping land open for roads.

67. Some animals were common in parts of Wisconsin 100 years ago. Now they are endangered. This is most likely because: (N = 1845, EL = 676, NI = 1169)

%TP	%EL	%NI		
8	6	9	a)	other animals chased them out or ate them.
8	5	10	b)	the weather changed.
74	81	70	c)*	people made too many changes in the animals' habitat.
11	8	12	d)	the animals or plants they ate died off.

68. If wild animal species need a place to live for the next 300 years it would be best to:
(N = 1845, EL = 673, NI = 1172)

%TP	%EL	%NI		
16	11	19	a)	put them in a zoo where they can be cared for and protected.
20	22	20	b)	put them in parks where they can be protected and still be free.
8	5	9	c)	let them live on land that people don't want to use.
56	62	52	d)*	save large areas of the animals' natural habitat.

69. Humans use energy from coal and oil by burning them. Another source of energy for humans is: (N = 1843, EL = 674, NI = 1169)

%TP	%EL	%NI		
8	5	9	a)	cold water.
9	6	11	b)	a well insulated home.
19	16	20	c)	a furnace.
65	73	60	d)*	the sun.

70. Which type of energy will be available for human use for the longest period of time?
(N = 1843, EL = 676, NI = 1167)

%TP	%EL	%NI		
7	5	8	a)	Oil.
7	6	8	b)	Coal.
15	11	18	c)	Nuclear energy.
70	78	66	d)*	Solar energy.

71. One energy source for humans is nuclear energy. However, people disagree about: (N = 1843, EL = 673, NI = 1170)

%TP	%EL	%NI		
44	52	39	a)*	storing nuclear waste for thousands of years.
20	19	20	b)	finding the materials needed to produce nuclear energy.
16	14	17	c)	finding people to work in the nuclear power plants.
20	15	23	d)	changing nuclear energy into electricity.

72. Why do people continue using energy sources that cannot be quickly replaced? (N = 1835, EL = 672, NI = 1163)

%TP	%EL	%NI		
15	12	16	a)	Those energy sources are non-renewable.
17	14	19	b)	The supply of energy is so large that it won't run out.
19	15	21	c)	When those energy sources run out scientists will have another one for people to use.
49	58	44	d)*	Those energy sources are more convenient than other sources.

73. Which energy source do scientists think will be in short supply in 300 years? (N = 1834, EL = 672, NI = 1162)

%TP	%EL	%NI		
6	4	7	a)	The wind.
63	68	61	b)*	Oil.
14	12	15	c)	Water flowing over a dam.
17	16	17	d)	The sun.

74. Fewer resources are wasted when shoppers buy things that: (N = 1837, EL = 677, NI = 1160)

%TP	%EL	%NI		
52	58	48	a)*	are in containers that can be used again.
12	9	14	b)	have a label saying they are made from natural products.
17	15	18	c)	are wrapped separately so they stay clean and new looking.
19	18	20	d)	are disposable.

75. The population of humans on the Earth is: (N = 1843, EL = 674, NI = 1169)

%TP	%EL	%NI		
5	4	6	a)	the same as it was 10 years ago.
10	7	12	b)	getting smaller.
76	82	73	c)*	growing larger.
8	7	9	d)	not changing.

76. Countries with small populations may be a part of the world's resource problems if they: (N = 1834, EL = 674, NI = 1160)

%TP	%EL	%NI		
19	17	20	a)	allow more people to leave their country.
18	13	20	b)	produce too much plant waste.
9	6	10	c)	do not have enough children.
54	64	49	d)*	use more resources than they need.

77. In the long term, which of the following is the best way to make the amount of garbage going to landfills smaller? (N = 1827, EL = 669, NI = 1158)

%TP	%EL	%NI		
18	16	18	a)	Reusing things before we throw them away.
12	10	13	b)*	Reducing the amount of things we use.
64	68	62	c)	Recycling as much as possible.
7	6	7	d)	Burning as much garbage as possible.

78. Which of the following is hazardous waste? (N = 1835, EL = 676, NI = 1159)

%TP	%EL	%NI		
13	10	15	a)	broken glass.
17	19	16	b)	laundry detergent.
59	62	58	c)*	batteries.
10	8	11	d)	decomposing plants.

79. The best way to find out how the people in your town feel about solid waste would be to: (N = 1827, EL = 672, NI = 1155)

%TP	%EL	%NI		
20	18	22	a)	read the newspaper and watch the news.
10	7	11	b)	talk to your friends.
60	68	55	c)*	do a survey of a large number of people.
10	7	12	d)	talk to the teachers in your school.

This is the end of the survey. Thank you for your participation!

Summary of Response Frequencies
1994 Environmental Survey of Wisconsin High School Students

Part One

(Editor note: The questions in Part One were used to develop a student profile.)

Instructions for Part One: Fill in the circle on your answer sheet for the letter of the answer that best indicates your response to each of the following questions.

1. What is your gender? (TP = 1805, EL = 668, NI = 1137)

%TP	%EL	%NI	
54	48	57	a) female
46	52	43	b) male

2. Compared to other subjects you study, how do you feel about studying environmental topics? (TP = 1805, EL = 669, NI = 1136)

%TP	%EL	%NI	
20	14	24	a) less interested
51	44	55	b) about the same
29	42	21	c) more interested

Key:

TP = Total Sample Population

EL = Students Identified as Environmentally Literate (teacher id'd or self id'd from # 3, choice a)

NI = Students Not Identified as Environmentally Literate (not id'd by either teacher or self)

3. Compared with other students your age, how well do you think you understand issues related to the environment? (TP = 1802, EL = 669, NI = 1133)

%TP	%EL	%NI	
25	67		a) above average
70	31	93	b) average
5	2	7	c) below average

4. What one thing has contributed most to your understanding of the environment and environmental issues? (choose only one answer) (TP = 1797, EL = 665, NI = 1132)

%TP	%EL	%NI	
22	16	26	a) school
25	30	22	b) books, newspapers, or magazines I have read on my own.
8	10	7	c) friends or family members (including parents)
10	12	10	d) field trips, special programs or activities such as clubs, scouting or 4H
34	31	36	e) television programs

5. What are your educational plans after high school? (TP = 1805, EL = 669, NI = 1136)

%TP	%EL	%NI	
2	2	3	a) no future educational plans at the present time
20	14	24	b) vocational/technical school
66	76	60	c) college or university
3	3	4	d) military
8	5	10	e) undecided

Part Two

(Editor note: The questions in Part Two were used to develop an affective profile. Items 6-28 measured student attitudes towards the environment. Items 29-35 measured student locus of control and degree of personal responsibility towards the environment.)

Instructions for Part Two: Please indicate how you feel about each statement below. There are no right or wrong answers. Read each statement carefully. Fill in the circle on your answer sheet for the letter that best indicates the extent to which you agree or disagree with each statement, using the following key:

Strongly Agree (SA)	Agree (A)	No opinion (N)	Disagree (D)	Strongly Disagree (SD)
(a)	(b)	(c)	(d)	(e)

6. I enjoy watching TV programs about nature. (TP = 1805, EL = 669, NI = 1136)

	SA	A	N	D	SD
%TP	18	43	21	14	4
%EL	24	50	14	9	2
%NI	14	39	25	17	5

7. When I am outside, I usually don't notice the natural things around me like flowers, trees, and clouds. (TP = 1805, EL = 669, NI = 1136)

	SA	A	N	D	SD
%TP	3	7	6	43	42
%EL	2	5	3	38	51
%NI	3	8	7	45	37

8. I'm not interested in reading about nature or the environment. (TP = 1807, EL = 669, NI = 1138)

	SA	A	N	D	SD
%TP	5	14	27	39	15
%EL	3	10	21	41	25
%NI	6	17	30	37	9

9. I like hearing the sound of animals such as birds and insects calling when I'm outside. (TP = 1804, EL = 667, NI = 1137)

	SA	A	N	D	SD
%TP	33	44	15	5	2
%EL	43	41	12	3	2
%NI	28	46	17	6	3

10. I think most of the concern about environmental problems has been exaggerated. (TP = 1805, EL = 668, NI = 1137)

	SA	A	N	D	SD
%TP	3	10	21	38	29
%EL	5	9	13	37	36
%NI	2	10	25	38	25

11. Knowing about environmental problems and issues is important to me. (TP = 1805, EL = 668, NI = 1137)

	SA	A	N	D	SD
%TP	17	50	26	6	2
%EL	27	51	16	4	2
%NI	11	49	32	7	2

12. A community's pollution regulations should not interfere with industrial growth and development. (TP = 1805, EL = 668, NI = 1137)

	SA	A	N	D	SD
%TP	4	11	25	35	26
%EL	5	9	17	35	34
%NI	3	12	29	35	21

13. I am concerned about the issue of deforestation. (TP = 1806, EL = 669, NI = 1137)

	SA	A	N	D	SD
%TP	30	41	22	4	2
%EL	40	42	12	3	2
%NI	24	41	28	5	1

14. I think that damage to the ozone layer is something that everyone should be concerned about. (TP = 1807, EL = 669, NI = 1138)

	SA	A	N	D	SD
%TP	41	43	10	4	2
%EL	45	40	9	4	2
%NI	39	45	11	4	1

15. More controls should be placed on industry and agriculture to protect the quality of the environment, even if it means that things that I purchase will cost more.
(TP = 1806, EL = 669, NI = 1137)

	SA	A	N	D	SD
%TP	17	40	28	11	4
%EL	24	43	21	9	3
%NI	13	39	32	11	5

16. I am not concerned about the fact that the world's deserts are increasing in size.
(TP = 1803, EL = 666, NI = 1137)

	SA	A	N	D	SD
%TP	2	10	28	42	17
%EL	2	9	24	43	23
%NI	3	11	31	41	14

17. There are already enough laws to protect the environment.
(TP = 1804, EL = 667, NI = 1137)

	SA	A	N	D	SD
%TP	3	8	19	44	27
%EL	3	6	12	43	36
%NI	2	9	23	44	22

18. I believe that plants and animals exist to be used by humans.
(TP = 1804, EL = 668, NI = 1136)

	SA	A	N	D	SD
%TP	8	19	24	27	21
%EL	10	18	21	26	25
%NI	7	20	26	28	19

19. I don't think that recycling is worth all the trouble it takes.
(TP = 1802, EL = 666, NI = 1136)

	SA	A	N	D	SD
%TP	2	5	8	39	46
%EL	2	4	6	34	55
%NI	2	5	10	42	41

20. I would oppose any environmental regulations that would restrict my way of life.
(TP = 1802, EL = 666, NI = 1136)

	SA	A	N	D	SD
%TP	4	10	29	42	15
%EL	4	8	22	45	21
%NI	4	12	34	39	11

21. More land should be set aside for wildlife habitats. (TP = 1807, EL = 669, NI = 1138)

	SA	A	N	D	SD
%TP	38	40	16	4	2
%EL	45	38	12	3	1
%NI	34	41	19	4	2

22. Environmental restrictions should be lifted so that exploration and production of fossil fuels can be increased. (TP = 1806, EL = 669, NI = 1137)

	SA	A	N	D	SD
%TP	2	9	35	33	21
%EL	3	8	23	35	31
%NI	2	10	42	32	15

23. If a person's car exceeds certain standards for air pollution, he or she should not be allowed to drive it. (TP = 1806, EL = 669, NI = 1137)

	SA	A	N	D	SD
%TP	20	39	23	12	5
%EL	28	39	18	10	6
%NI	16	40	26	14	5

24. The government should provide financial support for research and development related to renewable energy, even if it means that taxes will be higher.
(TP = 1803, EL = 668, NI = 1135)

	SA	A	N	D	SD
%TP	12	37	33	13	5
%EL	17	43	27	10	3
%NI	9	34	36	14	6

25. I am concerned about how much waste is produced in this country.
(TP = 1806, EL = 669, NI = 1137)

	SA	A	N	D	SD
%TP	23	53	19	5	1
%EL	30	55	11	3	-
%NI	19	51	23	6	1

26. Laws should be passed and enforced that protect the quality of life in the future even if it means that individual freedoms are limited. (TP = 1805, EL = 669, NI = 1136)

	SA	A	N	D	SD
%TP	10	39	33	14	4
%EL	14	40	31	13	3
%NI	8	38	35	15	5

27. I am not concerned about the rate of species extinction in the world. (TP = 1805, EL = 668, NI = 1137)

	SA	A	N	D	SD
%TP	2	7	12	42	37
%EL	2	5	8	37	48
%NI	2	8	15	44	31

28. I am concerned about environmental health hazards such as those caused by air or water pollution. (TP = 1806, EL = 669, NI = 1137)

	SA	A	N	D	SD
%TP	31	56	9	3	1
%EL	38	53	6	1	1
%NI	26	57	11	4	1

29. I want to help solve environmental problems. (TP = 1804, EL = 668, NI = 1136)

	SA	A	N	D	SD
%TP	19	48	26	5	2
%EL	29	48	18	4	1
%NI	13	48	31	6	2

30. There is not much that I can do that will help solve environmental problems. (TP = 1804, EL = 668, NI = 1136)

	SA	A	N	D	SD
%TP	3	16	17	47	17
%EL	3	12	13	48	24
%NI	4	18	20	46	13

31. I believe that I can contribute to the solution of environmental issues by my actions. (TP = 1804, EL = 668, NI = 1136)

	SA	A	N	D	SD
%TP	16	53	23	6	1
%EL	24	53	16	6	1
%NI	11	53	28	7	1

32. It's too hard to change my friends' minds about doing things to help the environment (for example, recycling). (TP = 1807, EL = 669, NI = 1138)

	SA	A	N	D	SD
%TP	6	18	29	40	7
%EL	6	18	24	43	9
%NI	6	18	32	38	6

33. An individual, working on his or her own, can contribute to the solution of environmental problems and issues. (N=1806, EL = 668, NI = 1138)

	SA	A	N	D	SD
%TP	13	52	21	11	3
%EL	17	54	13	13	4
%NI	10	51	25	11	3

34. Things that I do don't have much effect on the quality of the environment. (N=1807, EL = 669, NI = 1138)

	SA	A	N	D	SD
%TP	3	19	21	45	11
%EL	2	15	15	50	18
%NI	4	22	25	43	7

35. I feel that it is my responsibility to help solve environmental problems. (N=1804, EL = 669, NI = 1135)

	SA	A	N	D	SD
%TP	11	42	33	12	3
%EL	17	46	25	11	1
%NI	8	39	37	13	4

Part Three

(Editor note: The questions in Part Three were used to develop a behavioral profile.)

Instructions for Part Three: For the following group of statements, please indicate how frequently you do each of the actions mentioned. Be honest, there are no right or wrong answers. Fill in the circle on your answer sheet for the letter that is closest to your answer, using the following key:

Almost Always (AA)	Often (O)	Sometimes (S)	Almost Never (AN)	Never (N)
(a)	(b)	(c)	(d)	(e)

36. I turn off lights and appliances when they're not being used in order to conserve electricity. (TP = 1807, EL = 669, NI = 1138)

	AA	O	S	AN	N
%TP	39	32	24	3	1
%EL	44	34	19	2	1
%NI	37	32	26	4	2

37. I avoid purchasing products that are over-packaged. (TP = 1805, EL = 669, NI = 1136)

	AA	O	S	AN	N
%TP	4	11	41	26	17
%EL	6	14	40	28	13
%NI	4	9	42	26	20

38. I talk to people that I notice doing something that harms the environment in an effort to persuade that person to stop that activity. (For example, try to talk a friend into recycling pop cans instead of throwing them in the trash.) (TP = 1807, EL = 669, NI = 1138)

	AA	O	S	AN	N
%TP	7	18	36	24	16
%EL	11	21	35	22	11
%NI	5	16	37	25	18

39. I walk, take public transportation, or ride a bike instead of using a car in order to help protect the environment. (TP = 1805, EL = 668, NI = 1137)

	AA	O	S	AN	N
%TP	6	10	28	33	24
%EL	7	12	29	34	18
%NI	5	9	28	32	27

40. I make an effort to reduce the amount of goods I consume.
(TP = 1806, EL = 669, NI = 1137)

	AA	O	S	AN	N
%TP	5	16	39	27	14
%EL	5	20	35	29	10
%NI	4	13	41	26	16

41. I set a positive environmental example for my friends to follow.
(TP = 1807, EL = 669, NI = 1138)

	AA	O	S	AN	N
%TP	8	20	47	15	10
%EL	11	28	43	12	6
%NI	6	16	49	18	11

42. I support candidates for school offices who are concerned about environmental problems and issues in our school. (TP = 1795, EL = 666, NI = 1129)

	AA	O	S	AN	N
%TP	11	20	36	15	18
%EL	16	24	33	12	15
%NI	8	17	37	17	20

43. If I see an aluminum can on the ground when I'm out walking, I pick it up and take it with me. (TP = 1807, EL = 669, NI = 1138)

	AA	O	S	AN	N
%TP	8	15	31	24	22
%EL	12	18	31	23	17
%NI	6	13	31	25	24

44. I recycle paper, glass, and/or metal waste products at home or at school. (TP = 1805, EL = 669, NI = 1136)

	AA	O	S	AN	N
%TP	47	25	16	6	5
%EL	55	24	12	6	4
%NI	43	26	19	6	6

45. I avoid purchasing products that have a negative impact on the environment. (TP = 1804, EL = 668, NI = 1136)

	AA	O	S	AN	N
%TP	11	20	39	20	10
%EL	15	25	37	14	9
%NI	8	17	41	23	12

46. I talk to my family and friends about what they can do to help solve environmental problems. (N=1807, EL = 669, NI = 1138)

	AA	O	S	AN	N
%TP	5	11	28	30	26
%EL	7	15	30	30	18
%NI	3	8	27	31	31

47. I write or call politicians to express my views about environmental issues. (TP = 1805, EL = 667, NI = 1138)

	AA	O	S	AN	N
%TP	1	3	8	15	72
%EL	1	3	10	18	68
%NI	1	3	7	14	75

48. I make a point of reading newspaper and magazine articles about the environment. (TP = 1806, EL = 668, NI = 1138)

	AA	O	S	AN	N
%TP	8	18	37	22	16
%EL	12	25	35	16	12
%NI	5	14	38	25	19

49. I purchase one product over another product because it is packaged in reusable, returnable, or recyclable containers or packages. (TP = 1807, EL = 669, NI = 1138)

	AA	O	S	AN	N
%TP	9	20	36	20	16
%EL	14	26	33	15	13
%NI	6	16	39	22	18

50. I send letters to the newspaper about environmental problems or issues. (TP = 1806, EL = 669, NI = 1137)

	AA	O	S	AN	N
%TP	1	2	7	16	74
%EL	-	2	8	21	70
%NI	1	2	6	14	76

51. I have reported environmental problems or violations that I have noticed to the proper authorities. (N=1806, EL = 669, NI = 1137)

	AA	O	S	AN	N
%TP	1	4	12	18	65
%EL	2	6	13	21	58
%NI	1	3	11	16	69

Part Four

(Editor note: The questions in Part Four were used to develop a cognitive profile.)

Instructions for Part Four: For each of the following questions, choose the best answer. Fill in the circle for the letter of the answer on your answer sheet.

52. A food web consists of (TP = 1792, EL = 663, NI = 1129)

%TP	%EL	%NI		
14	9	16	a)	the animals that eat other animals in a community.
10	9	10	b)	all the herbivores and carnivores in an ecosystem.
52	59	48	c)*	many interconnected food chains.
24	23	25	d)	all the consumers in an ecosystem.

53. When two or more species attempt to use the same limited resource in an ecosystem, their interaction is called (TP = 1792, EL = 665, NI = 1127)

%TP	%EL	%NI		
13	12	14	a)	mutualism.
65	74	60	b)*	competition.
12	8	15	c)	predation.
9	7	11	d)	commensalism.

54. Having sharp thorns can help a plant by keeping animals from eating it. This is an example of (TP = 1798, EL = 668, NI = 1130)

%TP	%EL	%NI		
8	4	10	a)	mutualism.
70	80	63	b)*	adaptation.
6	4	7	c)	competition.
17	11	20	d)	commensalism.

55. All of the individual organisms that live on the ground in a particular forest share the same (TP = 1799, EL = 666, NI = 1133)

%TP	%EL	%NI		
11	12	10	a)	niche.
76	80	74	b)*	habitat.
7	4	9	c)	life-style.
5	3	7	d)	food source.

56. The reason dead leaves and twigs don't build up in a forest from year to year is because (TP = 1800, EL = 666, NI = 1134)

%TP	%EL	%NI		
5	2	6	a)	non-living elements such as wind and rain remove them.
75	84	70	b)*	decomposers break them down into soil.
14	10	16	c)	animals eat them or use them to build nests.
6	4	8	d)	none of the above.

57. Wolves often eat deer. Does this interaction have any beneficial effects on the deer population as a whole? (TP = 1797, EL = 666, NI = 1131)

%TP	%EL	%NI		
26	20	29	a)	Yes, the wolves help keep the deer population size controlled.
8	4	10	b)	No. The deer population is usually only harmed.
5	4	6	c)	Yes, the wolves help keep the deer population strong since the fastest, most alert deer survive.
61	72	55	d)*	both (a) and (c)

58. The energy currently present (TP = 1793, EL = 666, NI = 1127)

%TP	%EL	%NI		
7	6	7	a)	is all the energy we will ever have.
41	43	40	b)*	can change form but is never destroyed.
18	15	20	c)	can only be used once.
35	37	33	d)	is mostly in the form of fossil fuel energy.

59. Based upon major ecological principles, we should conclude that (TP = 1795, EL = 664, NI = 1131)

%TP	%EL	%NI		
4	2	6	a)	humans are a climax species that will last indefinitely.
10	8	11	b)	the human species will soon become extinct; nothing we can do will prevent this.
71	79	67	c)*	the human species will last as long as there is a balanced ecosystem that will support human life.
15	11	17	d)	there is no way of predicting what will happen to the human species; ecological principles do not apply to humans.

60. The process of photosynthesis in green plants (TP = 1794, EL = 666, NI = 1128)

%TP	%EL	%NI		
18	14	21	a)	uses sunlight to burn energy in plants.
47	54	43	b)*	changes light energy into chemical energy.
18	16	18	c)	changes chlorophyll into sugar.
17	17	18	d)	is a process used to burn sugar stored in plants so the plants can grow.

61. Which of the following terms is used to describe all of the natural living and nonliving interacting features of a given area? (TP = 1796, EL = 663, NI = 1133)

%TP	%EL	%NI		
17	13	19	a)	habitat
21	18	23	b)	community
11	8	13	c)	biodiversity
50	60	45	d)*	ecosystem

62. Humans grow crops for food. Many species of these plants need certain species of insects (such as bees) to pollinate them. The pollinating insects often rely on the nectar they obtain from the plants for food. This is a good example of (TP = 1800, EL = 667, NI = 1133)

%TP	%EL	%NI		
42	53	36	a)*	how organisms, including humans, are interdependent.
24	20	27	b)	commensalism between humans and other species.
10	6	11	c)	how humans manipulate their environment.
24	21	25	d)	a food web that includes humans.

63. A particular aquatic ecosystem is contaminated by a chemical which tends to remain stored in body fat. The highest concentration of this chemical would most likely be found in which group of organisms in the ecosystem? (TP = 1800, EL = 668, NI = 1132)

%TP	%EL	%NI		
16	11	19	a)	plant life
13	11	14	b)	minnows
28	25	30	c)	fish that eat insects and plants
43	52	37	d)*	fish-eating birds

64. Which of the following phrases refers to the potential ability of a system to support population growth without harming the environment? (TP = 1790, EL = 664, NI = 1126)

%TP	%EL	%NI		
32	44	24	a)*	carrying capacity
9	7	10	b)	species loading
11	7	13	c)	non-sustainable growth
48	42	52	d)	all of the above

65. In a small lake, a food chain was as follows:

sun → green algae → small crustaceans → fish

After many months of heavy snow covering the ice, most of the small crustaceans died. What is the best explanation for this? (TP = 1798, EL = 667, NI = 1131)

%TP	%EL	%NI		
70	78	64	a)*	The algae population was cut off from its source of energy.
16	13	18	b)	It was too cold for the crustaceans to survive.
9	6	11	c)	The fish ate most of the crustaceans.
5	3	6	d)	A disease killed most of the algae.

66. If carbon dioxide (CO2) disappeared from the atmosphere, which of the following would be affected first? (TP = 1794, EL = 666, NI = 1128)

%TP	%EL	%NI		
79	87	74	a)*	plants
8	6	9	b)	animals that eat plants
7	4	8	c)	animals that eat other animals
7	4	8	d)	decomposers

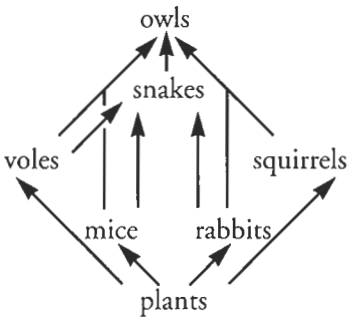
67. Each of the following food chains starts with the same amount of green plants. Assuming that the green plants are digestible by humans, which of the food chains would supply the most energy to humans? (TP = 1792, EL = 668, NI = 1124)

%TP	%EL	%NI		
35	38	33	a)*	green plants to humans
31	31	31	b)	green plants to cattle to humans
10	5	13	c)	green plants to insects to fish to humans
24	26	23	d)	green plants to insects to small fish to larger fish to humans

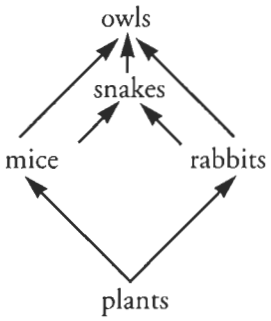
68. Some insecticides that were once effective in killing insects no longer work very well. This is because (TP = 1799, EL = 668, NI = 1131)

%TP	%EL	%NI		
14	11	15	a)	new insect species develop every day.
10	6	12	b)	the wrong kind of insecticides were used.
63	74	57	c)*	insects with natural resistance survived and multiplied.
13	8	16	d)	the insects produced many more offspring than the insecticide could kill.

69. Which of the food webs below would be affected the most if all of the mice were removed? (Note: the arrows point to the consumer of the organism in the food web.) (TP = 1797, EL = 667, NI = 1130)



Food Web (A)



Food Web (B)

%TP	%EL	%NI		
23	22	24	a)	food web (A)
40	48	34	b)*	food web (B)
8	4	10	c)	Neither would be affected.
29	25	32	d)	They would both be affected to the same degree.

70. Which of the following contributes to air pollution at the surface of the earth, and acts as a shield against ultraviolet rays in the upper atmosphere? (TP = 1801, EL = 666, NI = 1135)

%TP	%EL	%NI		
10	8	11	a)	nitrous oxide
13	12	13	b)	methane
65	67	63	c)*	ozone
13	13	13	d)	sulfur dioxide

71. The main source(s) of emissions that have been identified as contributing to acid deposition (acid rain) in the United States are (TP = 1793, EL = 665, NI = 1128)

%TP	%EL	%NI		
10	8	11	a)	volcanoes and forest fires.
12	9	13	b)	petroleum refineries.
62	68	58	c)*	automobiles and coal burning power plants.
17	15	17	d)	aerosol sprays and refrigerant leakage.

72. Which of the following is not true of the world's human population? (TP = 1793, EL = 666, NI = 1127)

%TP	%EL	%NI		
15	13	16	a)	It is expected to double within your lifetime.
49	55	45	b)*	It is declining in developed areas such as the United States and Canada.
21	18	23	c)	Its increase has led to the extinction of many plant and animal species.
15	14	15	d)	The greatest rate of population growth is occurring in developing areas such as South America and Africa.

73. The future of food production as it is currently practiced in this country is in question because (TP = 1792, EL = 664, NI = 1128)

%TP	%EL	%NI		
7	5	8	a)	soil is being depleted by erosion.
11	8	14	b)	the use of synthetic chemical additives has become an issue.
10	7	12	c)	agricultural land is being lost to development.
71	80	66	d)*	all of the above.

74. Which of the following would be most likely to cause groundwater pollution? (TP = 1791, EL = 665, NI = 1126)

%TP	%EL	%NI		
11	9	12	a)	organic farming practices
17	11	20	b)	municipal composting of yard wastes
49	59	43	c)*	adding too much fertilizer to fields
24	21	25	d)	wastewater treatment plants

75. The rate of species' extinction is higher now than at any time since the period of the dinosaurs' extinction. The main cause of this rapid decline in biodiversity is (TP = 1793, EL = 666, NI = 1127)

%TP	%EL	%NI		
44	56	37	a)*	habitat alteration by humans.
17	13	19	b)	the illegal poaching or collecting of animals and plants.
28	25	31	c)	changes in the Earth's atmosphere due to human activities.
11	7	13	d)	hunting by humans for food or sport.

76. Which of the following do scientists feel is the least important contributor to the greenhouse effect? (TP = 1802, EL = 669, NI = 1133)

%TP	%EL	%NI		
10	7	12	a)	destruction of the earth's rainforests
12	7	15	b)	burning of fossil fuels, such as gasoline and oil
50	62	43	c)*	increased use of hydroelectric power
29	25	31	d)	production of methane gas by cattle and rice paddies

77. Most municipal solid waste in the United States is presently disposed of by what method? (TP = 1791, EL = 663, NI = 1128)

%TP	%EL	%NI		
13	13	14	a)	burning it in closed incinerators
16	12	19	b)	recycling
12	10	14	c)	shipping it out to sea and dumping it
59	66	54	d)*	burying it in landfills

78. Which of the following is NOT a major water pollutant? (TP = 1787, EL = 660, NI = 1127)

%TP	%EL	%NI		
9	11	8	a)	bacteria
9	6	10	b)	pesticides
44	40	46	c)	heat
38	44	35	d)*	All of the above are major water pollutants.

79. One suggested advantage of using nuclear power plants for energy production is that (TP = 1790, EL = 666, NI = 1124)

%TP	%EL	%NI		
9	7	11	a)	nuclear power plants are not expensive to build.
24	18	28	b)	the waste products are fairly easy to store.
60	71	54	c)*	there is less air pollution.
7	5	8	d)	they are totally safe.

80. Which of the following results in the most serious waste or loss of our usable water? (TP = 1786, EL = 662, NI = 1124)

%TP	%EL	%NI		
24	22	25	a)	contamination by bacteria
22	20	22	b)	uncontrolled drainage
44	48	42	c)*	careless usage
10	8	11	d)	improper storage

81. Which of the following would be most likely to result in soil erosion? (TP = 1801, EL = 666, NI = 1135)

%TP	%EL	%NI		
11	7	13	a)	an increase in nutrients added to the soil
55	68	48	b)*	the removal of vegetation
18	13	21	c)	contour plowing of hillsides
16	11	18	d)	aeration of the soil by bacteria

82. Which of the following is considered to be a non-renewable energy source? (TP = 1799, EL = 667, NI = 1132)

%TP	%EL	%NI		
46	57	40	a)*	oil
15	13	17	b)	wood
14	10	16	c)	biomass
25	20	27	d)	none of the above

83. Which of the following is a naturally occurring, invisible gas which can seep out of the ground into people's homes and cause serious health problems? (TP = 1789, EL = 664, NI = 1125)

%TP	%EL	%NI		
20	18	21	a)	ethane
9	6	11	b)	krypton
58	66	54	c)*	radon
13	10	14	d)	chlorofluorocarbon

84. A major nuclear accident occurred in 1986 at the_____ nuclear power plant. (TP = 1786, EL = 664, NI = 1122)

%TP	%EL	%NI		
15	11	17	a)	Belgrade
16	10	20	b)	Nagasaki
48	56	44	c)*	Chernobyl
20	23	19	d)	Three Mile Island

85. Which of the following offers the most potential for reducing our immediate energy problems? (TP = 1780, EL = 664, NI = 1116)

%TP	%EL	%NI		
17	14	18	a)	geothermal power
59	67	54	b)*	energy conservation
13	10	14	c)	biomass conversion
12	9	13	d)	tidal power

86. Having your household water tested is important if (TP = 1786, EL = 662, NI = 1124)

%TP	%EL	%NI		
7	5	8	a)	you live in an old house.
12	8	14	b)	your water comes from a well.
6	4	7	c)	you live in an agricultural area.
76	84	71	d)*	all of the above.

87. Which of the following is most likely to help endangered species? (TP = 1791, EL = 665, NI = 1126)

%TP	%EL	%NI		
21	20	22	a)	Outlaw the sale or possession of endangered species or products made from them (skins, furs, ivory, etc.).
20	17	22	b)	Create breeding programs in zoos for endangered animals.
12	9	14	c)	Use farming methods which do not damage habitat.
47	54	43	d)*	Maintain large protected natural areas where they live.

88. In the long term, which of the following would be the best way to lessen the problem of solid waste? (TP = 1783, EL = 661, NI = 1122)

%TP	%EL	%NI		
8	4	9	a)	Incinerate waste materials.
25	27	24	b)*	Reduce the amount of materials being consumed.
25	22	26	c)	Reuse materials for other purposes rather than throwing them out.
43	47	41	d)	Recycle materials that can be used again.

89. Which of the following would be the most effective method to influence a large number of people to take action about an environmental problem? (TP = 1782, EL = 660, NI = 1122)

%TP	%EL	%NI		
7	5	8	a)	Advertise on the radio.
9	5	11	b)	Write letters to the newspaper.
9	7	10	c)	Go door to door and talk to people.
76	83	71	d)*	Use a combination of the above.

90. If your student environmental club was concerned about an environmental issue, which of the following would be the best thing to do first? (TP = 1779, EL = 661, NI = 1118)

%TP	%EL	%NI		
11	6	13	a)	Write and circulate a petition about the issue.
18	14	20	b)	Talk to other people about what they could do to help resolve the issue.
10	9	10	c)	Write to elected officials about your concern.
62	71	56	d)*	Research the issue.

This is the end of the survey. Thank you for your participation!

Summary of Response Frequencies and Means
1992 Environmental Education Survey of Wisconsin Teachers

SECTION I

1. How many years have you been teaching in your current district? N=914

1.	1 to 5 years (n=262; 28.6%)	3.	11 to 15 years (n=129; 14.1%)	5.	21 to 25 years (n=147; 16.1)
2.	6 to 10 years (n=137; 15%)	4.	16 to 20 years (n=137; 15%)	6.	Over 25 years (n=102; 11.1%)

2. In total, how many years have you been teaching? N=915

1.	1 to 5 years (n=155; 16.9%)	3.	11 to 15 years (n=139; 15.2%)	5.	21 to 25 years (n=158; 17.3%)
2.	6 to 10 years (n=133; 14.5%)	4.	16 to 20 years (n=170; 18.6%)	6.	Over 25 years (n=159; 17.4%)

3. When did you receive your Wisconsin teaching certificate? N=909

1. Before 1985 (n=702; 77.2%) 2. 1985 or after (n=207; 22.8%)

4. What is your gender? N=915

1. Female (n=629; 68.7)
2. Male (n=286; 31.3%)

5. Did you receive pre-service teacher education in environmental education (EE) from a Wisconsin institution? N=896

1. Yes (n=163; 18.2%) 2. No (n=733; 81.8%)

6. Please write the name of the institution in the space provided. (See page 84 for results)

7. Rate the general value of your pre-service EE course(s) with regard to effectiveness in preparing you to teach about the environment. N=198

1. Very effective	2. Somewhat effective	3. Undecided	4. Not very effective	5. Ineffective
(n=47; 23.7%)	(n=86; 43.4%)	(n=35; 17.7%)	(n=20; 10.1%)	(n=10; 5.1%)

8. Have you received in-service education or taken post-graduate courses in Wisconsin relating to environmental education (EE) or teaching about the environment? N=899

1. Yes (n=274; 30.5%) 2. No (n=625; 69.5%)

9. Fill in the number of courses you have taken. (See page 85 for results)

10. Rate the general value of the EE course(s) with regard to effectiveness in preparing you to teach about the environment. N=284

1. Very effective	2. Somewhat effective	3. Undecided	4. Not very effective	5. Ineffective
(n=93; 32.7%)	(n=146; 51.4%)	(n=25; 8.8%)	(n=18; 6.3%)	(n=2; 0.7%)

11. What grade level or subject area do you teach? (See page 86 for summary of responses and also grade level/subject area relationships to questions 3, 5, and 14.)

12. Does your school district have a written EE curriculum plan? N=905

1. Yes	2. Not sure	3. No
(n=271; 29.9%)	(n=476; 52.6%)	(n=158; 17.5%)

13. Do you have a copy of the plan? N=444
1. Yes (n=193; 43.5%) 2. No (n=251; 56.5%)

14. Do you currently infuse education about the environment into your class curriculum? (N=891)

1.	Yes	(n=595; 66.8%)
2.	No	(n=217; 24.4%)
3.	Not sure	(n=79; 8.9%)

15. Please indicate the MAIN reason for not infusing environmental concepts into your classroom teaching. (Choose only one) N=297

1. I do not have the knowledge or background to teach about the environment effectively. n=72; 24.2%
2. I do not have the class time. n=45; 15.2%
3. I do not have enough preparation time. n=22; 7.4%
4. I do not have enough resources or funding. n=12; 4%
5. Environmental concepts are unrelated to my subject area. n=75; 25%
6. My school setting is not conducive to teaching about the environment. n=7; 2.4%
7. Education about the environment is not appropriate for the grade level I teach. n=5; 1.7%
8. I am not interested in teaching about the environment. n=0
9. There are things other than EE that are more important to infuse into my teaching. n=20; 6.7%
10. Other n=39; 13.1%

16. Please indicate which ONE statement best represents the situation which would influence you the most to infuse environmental concepts into your classroom teaching. (Choose only one) N=289

1. More support from my administration.
   n=14; 4.8%
2. More in-service classes on environmental education teaching methods.
   n=89; 30.8
3. Better access to resources and aids for teaching about the environment.
   n=76; 26.3%
4. More preparation time.
   n=51; 17.6%
5. More funding.
   n=2; .7%
6. Other.
   n=57; 19.7%

SECTION II

Environmental Education Attitudes and Practices

The purpose of this section is to assess general attitudes and information regarding your teaching as it relates to environmental education (EE).

		SA	A	U	D	SD	
1.	The main reason I teach students about the environment is because it is mandated.	15	21	23	330	236	(n)
	N = 625; M (mean) = 4.2; SD = 0.85	2.4	3.4	3.7	52.8	37.8	(%)
2.	EE should be considered a priority in our K-12 educational system.	208	298	68	38	11	
	N = 623; M = 4.05; SD = 0.92	33.4	47.8	10.9	6.1	1.8	
3.	I believe it is important . . . to integrate environmental concepts and issues . . . into my teaching.	269	319	15	8	14	
		43	51	2.4	1.3	2.2	
	N = 625; M = 4.31; SD = 0.78						
4.	Pre-service teachers should be required to take an EE methods class.	155	242	142	60	25	
	N = 624; M = 3.71; SD = 1.07	24.8	38.8	22.8	9.6	4	
5.	I am effective at infusing the study of environmental concepts and issues into my subject...	101	344	141	30	12	
	N = 628; M = 3.78; SD = 0.84	16.1	54.8	22.3	4.8	1.9	

6.	A goal of my teaching is to increase students' level of environmental responsibility.	215	345	27	28	10
	N = 625; M = 4.16; SD = 0.83	34.4	55.2	4.3	4.5	1.6
7.	Teachers should provide students with opportunities to gain actual experience in resolving environmental issues.	179	374	61	5	7
	N = 626; M = 4.14; SD = 0.71	28.6	59.7	9.7	0.8	1.1
8.	Teachers should help students develop a set of values and feelings of concern for the environment.	315	286	15	4	7
	N = 627; M = 4.43; SD = 0.68	50.2	45.6	2.4	0.6	1.1
9.	I am/was actively involved in helping to implement my...district's EE curriculum plan.	46	109	62	216	184
	N = 617; M = 2.38; SD = 1.28	7.5	17.7	10	35	29.8
10.	It is a good idea to mandate that school districts develop and implement an EE curriculum plan.	143	283	116	58	24
	N = 624; M = 3.74; SD = 1.03	22.9	45.4	18.6	9.3	3.8
11.	I am pleased with the quality of my school district's EE curriculum plan.	37	139	307	77	48
	N = 608; M = 3.07; SD = 0.96	6.1	22.9	50.5	12.7	7.9

12. How often do you refer to your school district EE curriculum plan?
N=608; M = 3.07; SD = .96

1 = Never	2 = Yearly	3 = Monthly	4 = Twice a month	5 = Weekly
(n=358; 58.9%)	(n=140; 23%)	(n=64; 10.5%)	(n=25; 4.1%)	(n=21; 3.5%)

For questions 13 through 15, choose the answer that best fits your teaching situation.

13. What percentage of your instructional time includes infusion of environmental concepts? N=608

1. Less than 5% (n=227; 36.3%)
2. 5% to 14% (n=252; 40.3%)
3. 15% to 24% (n=93; 14.9%)
4. 25% to 49% (n=40; 6.4%)
5. 50% or more (n=14; 2.2%)

14. For each subject that you teach, approximately how much time per week do you spend teaching about the environment? N=620

1.	Less than 30 minutes	(n=461; 74.4%)
2.	31 minutes to 60 minutes	(n=119; 19.2%)
3.	61 minutes to 90 minutes	(n=23; 3.7%)
4.	91 minutes to 120 minutes	(n=7; 1.1%)
5.	121 minutes to 150 minutes	(n=6; 1%)
6.	151 minutes to 180 minutes	(n=1; 0.2%)
7.	181 minutes to 210 minutes	(n=1; 0.2%)
8.	211 minutes to 240 minutes	(n=1; 0.2%)
9.	Over 240 minutes	(n=1; 0.2%)

15. For all subjects that you teach combined, approximately how much time per week do you spend teaching about the environment? N=618

1.	Less than 30 minutes	(n=261; 42.2%)
2.	31 minutes to 60 minutes	(n=206; 33.3%)
3.	61 minutes to 90 minutes	(n=79; 12.8%)
4.	91 minutes to 120 minutes	(n=34; 5.5%)
5.	121 minutes to 150 minutes	(n=14; 2.3%)
6.	151 minutes to 180 minutes	(n=8; 1.3%)
7.	181 minutes to 210 minutes	(n=8; 1.3%)
8.	211 minutes to 240 minutes	(n=2; 0.3%)
9.	Over 240 minutes	(n=6; 1%)

SECTION III

Cognitive Education Methods

This section refers to the use of cognitive education methods which can be used to encourage awareness of environmental concepts and problems, to increase knowledge of ecological foundations and environmental issues, and to develop skills which can be used to help resolve environmental issues.

Questions 16 and 17 refer to cognitive education methods which could include but are not limited to:

1. Outdoor teaching strategies
2. Guided discovery
3. Lectures
4. Experiments
5. Role playing and dramatizations
6. Problem-solving/critical thinking
7. Case studies
8. Data gathering and analysis
9. Audiovisuals
10. Environmental issue investigations
11. Simulations
12. Self-directed learning
13. Cooperative learning
14. Computer-oriented activities
15. Writing, art, and music
16. Independent or group projects
17. Community resource use
18. Observations (field trips, demonstrations, bulletin boards/displays, guest speakers, etc.)

16. Indicate how many of the above methods you feel are valuable for teaching about the environment. N=620

1.	Less than 3	(n=5; 0.8%)
2.	3 - 5	(n=34; 5.5%)
3.	6 - 8	(n=60; 9.7%)
4.	9 - 11	(n=82; 13.2%)
5.	12 - 14	(n=117; 18.9%)
6.	15 - 18	(n=322; 51.9%)

17. For question 17, please do the following two things:

a. On the answer sheet, please put a check by each of the methods you have used effectively to teach students about the environment.

Tabulations of methods perceived used effectively: (N=588)

1. Outdoor teaching strategies (n=350)
2. Guided discovery (n=294)
3. Lectures (n=397)
4. Experiments (n=343)
5. Role playing and dramatizations (n=244)
6. Problem-solving/critical thinking (n=390)
7. Case studies (n=115)
8. Data gathering and analysis (n=198)
9. Audiovisuals (n=407)
10. Environmental issue investigations (n=206)
11. Simulations (n=134)
12. Self-directed learning (n=236)
13. Cooperative learning (n=364)
14. Computer-oriented activities (n=106)
15. Writing, art, and music (n=355)
16. Independent or group projects (n=299)
17. Community resource use (n=202)
18. Observations (n=479)
(field trips, demonstrations, bulletin boards/displays, guest speakers, etc.

b. Total the number of methods you checked and using the following key, place the total in the space provided for question 17. (n=610)

1 = Less than 3	(n=48; 7.9%)
2 = 3 - 5	(n=113; 18.5%)
3 = 6 - 8	(n=148; 24.3%)
4 = 9 - 11	(n=124; 20.3%)
5 = 12 - 14	(n=104; 17%)
6 = 15 - 18	(n=73; 12%)

For questions 18 through 23, use the following key to indicate your opinion.

1 = Strongly disagree 2 = Disagree 3 = Undecided 4 = Agree 5 = Strongly agree

	SA	A	U	D	SD
18. As a result of attending my class, students are more aware of environmental concepts and problems.	92	401	100	20	11(n)
N= 624; M (mean) =3.87; SD = .76	14.7	64.3	16	3.2	1.8(%)

19.	As a result of attending my class, students are more knowledgeable of ecological foundations and environmental issues. N = 624; M = 3.65; SD = .85	70 11.2	337 54	163 26.1	38 6.1	16 2.6
20.	I am effective at teaching students the skills needed to resolve environmental issues. N = 619; M = 3.39; SD = .80	40 6.5	241 38.9	270 43.6	59 9.5	9 1.5
21.	As a result of attending my class, students are more aware of the impact their individual behaviors have on the environment. N = 603; M = 3.98; SD = .82	117 19.4	386 64	80 13.3	13 2.2	7 1.2
22.	My pre-service teacher education effectively prepared me in using cognitive education methods to teach students about the environment. N = 157; M = 3.19; SD = 1.09	10 6.4	70 44.6	27 17.2	39 24.8	11 7
23.	My in-service or post-graduate courses effectively prepared me in using cognitive education methods to teach students about the environment. N = 251; M = 3.63; SD = .89	29 11.6	135 53.8	56 22.3	26 10.4	5 2

SECTION IV

Affective Education Methods

This section refers to the use of affective education methods which can be used to examine attitudes and values related to environmental issues.

Questions 24 through 26 refer to the following environmental values education (EVE) methods:

1. Sensory or awareness activities
2. Action learning
3. Behavior modification
4. Moral development activities
5. Inculcation
6. Values clarification
7. Values analysis

24. Indicate how many of the above approaches you feel are valuable for helping students examine attitudes and values pertaining to environmental issues. N=578

1.	1	(n=9; 1.5%)
2.	2	(n=21; 3.6%)
3.	3	(n=65; 11.1%)
4.	4	(n=99; 17%)
5.	5	(n=81; 13.9%)
6.	6	(n=57; 9.8%)
7.	7	(n=123; 21.1%)
8.	Not sure	(n=123; 21.1%)

25. For question 25, please do the following two things:

a. On the answer sheet, please put a check by each of the methods you have used effectively to help students examine attitudes and values pertaining to environmental issues.

Tabulation of methods perceived used effectively: N=503

1. Sensory or awareness activities (n=424)
2. Action learning (n=350)
3. Behavior modification (n=166)
4. Moral development activities (n=242)
5. Inculcation (n=65)
6. Values clarification (n=261)
7. Values analysis (n=219)

b. Total the number of methods that you checked and place the total in the space provided for question 25. N=543

1.	1	(n=35; 6.4%)
2.	2	(n=106; 19.5%)
3.	3	(n=100; 18.4%)
4.	4	(n=99; 18.2%)
5.	5	(n=78; 14.4%)
6.	6	(n=33; 6.1%)
7.	7	(n=14; 2.6%)
8.	do not use	(n=38; 7.0%)
9.	not sure	(n=40; 7.4%)

26. Please indicate the MAIN reason you have not used or are not sure if you have used any of the above environmental values education (EVE) approaches. (Choose only one) N=334

1.	It is not my responsibility to teach EVE.	(n=12; 3.7%)
2.	I do not feel comfortable teaching EVE.	(n=3; 0.9%)
3.	I feel it is unethical to teach EVE.	(n=2; 0.6%)
4.	Many of the methods are inappropriate for the grade level I teach.	(n=43; 13.3%)
5.	EVE is unrelated to my subject.	(n=16; 4.9%)
6.	I do not know enough about these methods to use them.	(n=65; 20.1%)

7.	I may have used these methods, but do not know them by these names.	(n=111;	34.3%)
8.	My school district doesn't allow values education.	(n=4;	1.2%)
9.	None of the above.	(n=68;	21%)

		SA	A	U	D	SD
27.	As a result of being in my class, students better understand the roles that values play in environmental issues. N = 599; M (mean) = 3.52; SD = .82	42 7	302 50.4	202 33.7	37 6.2	16(n) 2.7(%)
28.	I believe students are more sensitive toward the environment as a result of attending my class. N = 605; M = 3.80; SD = .73	68 11.2	387 64	125 20.7	14 2.3	11 1.8
29.	Students have a better understand about their beliefs, attitudes, and values regarding environmental issues as a result of attending my class. N = 603; M = 3.53; SD = .77	37 6.1	298 49.4	232 38.5	22 3.6	14 2.3
30.	(Leave blank if did not receive pre-service education in EE) My pre-service teacher education effectively prepared me to use affective education methods to help students examine values relating to environmental issues. N = 169; M = 3.03; SD = 1.07	9 5.3	58 34.3	45 26.6	43 25.4	14 8.3
31.	(Leave blank if have not taken any in-service or post-graduate courses in EE) My in-service or post-graduate courses effectively prepared me to use affective education methods to help students examine values relating to environmental issues. N = 243; M = 3.18; SD = 1.09	25 10.3	86 35.4	70 28.8	44 18.1	18 7.4

SECTION V

Environmental Action Strategies

This section refers to categories of action strategies which individuals or groups can use to help resolve environmental issues. Descriptions of each category are provided.

Persuasion The process of trying to convince others that a certain source of action is correct. Examples include letter-writing, debates, posters, etc.

Economic action The process of using economic pressure to support or oppose a business or industry. Examples include buying environmentally friendly products, boycotting, raising funds for an environmental group, etc.

Political action Any action that brings pressure on political or governmental agencies. Examples include writing letters to representatives, lobbying, voting, etc.

Ecomanagement The process of taking physical action toward the environment for the purpose of either maintaining a good environment or improving a weakened environment. Examples include picking up litter, conserving energy, planting trees, etc.

Legal action This action involves using legal processes to alter the behavior of an individual or a business or industry that is damaging the environment. Examples include reporting environmental offenses, bringing suit against polluters, etc.

32. Have you involved students in action strategies, such as those described above, to provide them with opportunities to gain experience in the resolution of environmental issues? N=589

1.	Yes	(n=363; 61.5%)
2.	No	(n= 206; 34.9%)
3.	I don't know	(n=20; 3.4%)

33. For question 33, please do the following two things:

a. On the answer sheet, please put a check by each of the strategies you have used effectively to provide students with experiences they can use to help resolve environmental issues.

Tabulations of methods perceived used effectively: (N=354)

1. Persuasion	(n=238)
2. Economic Action	(n=106)
3. Political Action	(n=57)
4. Ecomanagement	(n=271)
5. Legal Action	(n=12)

b. Total the number of methods that you checked and place the total in the space provided for question 33.

1.	1	(n=134; 36.5%)
2.	2	(n=129; 35.1%)
3.	3	(n=67; 18.3%)
4.	4	(n=26; 7.1%)
5.	5	(n=4; 1.1%)

Note: 7 teachers (1.9%) chose '0'.

34. Please indicate the MAIN reason you have not involved your students in one or more of the above actions. (Choose only one)

1.	There is no time	(n=70; 21.9%)
2.	It is inappropriate for of the grade level	(n=79; 24.8%)
3.	I do not have the knowledge	(n=63; 19.7%)
4.	These actions are not related to subject	(n=49; 15.4%)
5.	My administration does not support	(n=3; 0.9%)
6.	None of the above.	(n=55; 17.2%)

		SA	A	U	D	SD
35.	After attending my class, students are aware of the need to become involved in resolving environmental issues. N = 602; M (mean) = 344; SD = .85	39 6.5	275 45.7	212 35.2	62 10.3	14 (n) 2.3(%)
36.	As a result of taking my class, students have gained actual experience in resolving environmental issues. N = 599; M = 3.14; SD = 1.03	35 5.8	229 38.2	156 26	144 24	35 5.8
37.	I am effective at teaching students how to use action strategies to resolve environmental issues. N = 591; M = 2.95; SD = .92	20 3.4	140 23.7	255 43.1	141 23.9	35 5.9
38.	My pre-service teacher education was effective at providing me with strategies I can use to give students experience in resolving environmental issues. N = 161; M = 2.86; SD = 1.09	5 3.1	51 31.7	42 26.1	42 26.1	21 13
39.	My in-service or post-graduate courses were effective at providing me . . . N = 247; M = 3.18; SD = 1.03	19 7.7	88 35.6	72 29.1	55 22.3	13 5.3
40.	I believe my instruction contributes to the development of environmentally literate citizens. N = 582; M = 3.84; SD = .87	99 17	351 60.3	92 15.8	19 3.3	21 3.6

Name of University where rec'd EE training (Results of question #6)		Does Infuse n/%	Pr 85*	Po 85*	Doesn't Infuse n/%	Pr 85	Po 85
UW Whitewater	(n=20; 13.1%)	17/85	9	8	3/15	0	3
UW Stevens Point	(n=18; 11.8 %)	15/83	9	6	3/17	2	1
UW La Crosse	(n=17; 11.1%)	15/88	6	9	2/12	0	2
UW Oshkosh	(n=17; 11.1%)	16/94	11	5	1/6	0	1
UW Riverfalls	(n=11; 7.2%)	8/73	5	3	3/27	1	2
UW Eau Claire	(n=10; 6.5%)	8/80	4	4	2/20	0	2
UW Green Bay	(n=8; 5.2%)	7/88	4	3	1/12	0	1
UW Madison	(n=8; 5.2%)	8/100	2	6	0/0	0	0
UW Milwaukee	(n=7; 4.6%)	7/100	3	4	0/0	0	0
UW Superior	(n=5; 3.3%)	4/80	4	0	1/20	0	1
Northland College	(n=4; 2.0%)	4/100	3	1	0/0	0	0
Marinette Teachers College	(n=3; 2.0%)	2/67	1	1	1/33	1	0
Alverno College	(n=2; 1.3%)	2/100	1	1	0/0	0	0
Carroll College	(n=2; 1.3%)	0/0	0	0	2/100	1	1
UW Platteville	(n=2; 1.3%)	2/100	1	1	0/0	0	0
St. Norbert College	(n=2; 1.3%)	1/50	1	1	1/50	0	1
FOR ALL THE REST OF THE INSTITUTIONS:	(n=1; 0.7%)						
Audubon Center		1/100	0	1	0/0	0	0
Carthage College		1/100	0	1	0/0	0	0
Concordia College		1/100	0	1	0/0	0	0
Fallen Timbers		1/100	1	0	0/0	0	0
Lakeland College		1/100	1	0	0/0	0	0
Milwaukee Audubon		0/0	0	0	1/100	1	0

*Pr 85 represents teachers certified prior to 1985
*Po 85 represents teachers certified in 1985 or after

Universities where received EE training con't. (Results of question #6)	Does Infuse n/%	Pr 85	Po 85	Doesn't Infuse n/%	Pr 85	Po 85
Mt. Senario College	1/100	1	0	0/0	0	0
Outagamie Teachers College	1/100	1	0	0/0	0	0
Racine/Kenosha Teachers College	1/100	1	0	0/0	0	0
Sheyboygan Teachers College	1/100	1	0	0/0	0	0
Silver Lake College	1/100	1	0	0/0	0	0
Taylor County	1/100	1	0	0/0	0	0
UW Center Baraboo	1/100	0	1	0/0	0	0
UW Center Baron	1/100	1	0	0/0	0	0
UW Center Washington	1/100	0	1	0/0	0	0
UW Parkside	1/100	1	0	0/0	0	0
UW Stout	1/100	0	1	0/0	0	0

Results from question #9:

Number of in-service/post-graduate EE courses taken: N=288

1	(n=132; 45.8%)
2	(n=75; 26%)
3	(n=34; 11.8%)
4	(n=18; 6.3%)
5	(n=13; 4.5%)
6	(n=3; 1%)
7	(n=2; 0.7%)
8	(n=3; 1%)
9 or more	(n=8; 2.8%)

Results from question #11: What grade level or subject do you teach? N=906

		Does Infuse EE				Doesn't Infuse			
		n %	Pr 85*	Po 85*	Pr EE*	n %	Pr 85	Po 85	Pr EE
1.	Elementary (n = 517; 57.1%)	393 76	264	129	57	124 24	90	34	12
2.	Science (n = 70; 7.7%)	66 94	51	15	9	4 6	1	3	2
3.	Social Sciences (n = 31; 3.4%)	23 74	18	5	3	8 26	7	1	1
4.	Language Arts (n = 63; 7%)	32 51	18	14	2	31 49	21	10	0
5.	Math (n = 39; 4.3%)	14 36	3	11	1	25 64	17	8	0
6.	Business (n = 15; 1.7%)	4 27	3	1	0	11 73	10	1	0
7.	Home Economics (n = 21; 2.3%)	16 76	16	0	0	5 24	5	0	0
8.	Music (n = 65; 7.2%)	23 35	12	11	0	42 65	35	7	0
9.	Art (n = 41; 4.5%)	30 73	24	6	0	11 27	8	3	0
10.	Technical Education (24; 2.6%)	14 58	14	0	0	10 42	10	0	0
11.	Agriculture (n = 7; 0.8%)	7 100	6	1	0	0 0	0	0	0
12.	Health (n = 13; 1.4%)	8 62	4	4	3	5 38	3	2	1

*Pr 85 represents teachers certified prior to 1985
*Po 85 represents teachers certified in 1985 or after
*Pr EE represents the number of teachers who received their certification after 1985 and reported that they did receive pre-service training in EE

Summary of Response Frequencies and Means
1994 Environmental Education Survey of Wisconsin School Administrators

Editor Note: The following data was compiled from two environmental education surveys, one sent to Wisconsin public school principals and the other sent to directors of curriculum in February of 1994. Although questions on each survey were virtually identical, principals answered questions based on the situation in their school and directors of curriculum reported on the situation in their district. In this summary, the term "school/district" is used to indicate that the word "school" appeared in the principal survey and "district" appeared in the survey to directors of curriculum. Some other symbols in this survey are defined as follows:

principal/director of curriculum = the word "principal" appeared on the survey to principals and "director of curriculum" appeared on the survey to directors of curriculum
~ = question or response choice only appeared on surveys sent to principals
‡ = question or response choice only appeared on surveys sent to directors of curriculum
N = the total number of individuals who responded to the item
n = the number of individuals who chose a particular optional response in a given item
% = the percentage of individuals who selected a particular response

SECTION I

The purpose of this section was to obtain general information about the respondent's professional experience, degree of training in environmental education and his/her feelings towards environmental education.

		Principal		Director of Curriculum	
1.	Please indicate your primary job responsibilities:	(N=901)		(N=199)	
		n	%	n	%
1.	full time principal/director of curriculum	779	86.5	97	48.7
2.	...and district administrator for my district	39	4.3	62	31.2
3.	...and director of curriculum/instruction for my district ~	35	3.9	——	——
4.	...and principal for my district ‡	——	——	8	4.0
5.	...and other responsibilities	48	5.3	32	16.1

2.	How many years have you been a part or full time school principal/director of curriculum? (include previous job experiences)	(N=901)		(N=199)	
		n	%	n	%
1.	less than 3 years	140	15.5	38	19.1
2.	3-6 years	210	23.3	72	36.2
3.	7-10 years	151	16.8	35	17.6
4.	over 10 years	400	44.4	54	27.1

3. Please indicate which population you supervise or work with the most.

		(N=901)		(N=199)	
		n	%	n	%
1.	elementary personnel (K-8)	491	54.5	13	6.5
2.	middle school/jr. high personnel (6-9)	136	15.1	——	——
3	secondary personnel (9-12)	212	23.5	4	2 0
4.	personnel from all grade levels	31	3.4	173	86.9
5.	middle & secondary teachers -	31	3.4	——	——
6	other administrative staff ‡	——	——	9	4.5

4. Please estimate the number of environmental education courses, workshops or in-services you have attended.

		Principal (N=901)		Director of Curriculum (N=199)	
		n	%	n	%
1.	none	203	22.6	40	20.1
2.	1 - 2	368	40.9	95	47.7
3.	3 - 4	191	21.2	41	20.6
4	5 - 6	44	4.9	11	5.5
5	more than 6	93	10 3	12	6.0

For questions #5 through #14, administrators were asked to indicate their opinion about the following statements. In this summary, P = principals; DC = directors of curriculum.

	Schools should...		strongly disagree		disagree		undecided		agree		strongly agree	
			P	DC	P	DC	P	DC	P	DC	P	DC
5.	build student **awareness and sensitivity** to the total (human and natural) environment and its associated problems.	n	2	1	3	1	7	1	310	69	579	127
		%	.2	.5	.3	.5	.8	.5	34.4	34.7	64.3	63.8
6.	provide opportunities for students to acquire a **basic knowledge and understanding** of the environment and our human relationship to the environment.	n	4	2	--	--	2	--	326	65	568	132
		%	.4	1.0			.2		36.2	32.7	63.1	66.3
7.	provide opportunities for students to develop **attitudes and feelings** of concern for the environment.	n	4	2	8	1	28	9	363	82	496	105
		%	.4	1.0	.9	.5	3.1	4.5	40.4	41.2	55.2	52.8
8.	provide opportunities for students to acquire the **motivation and commitment** to participate in the maintenance and improvement of environmental quality.	n	2	2	9	2	77	17	407	90	404	88
		%	.2	1.0	1.0	1.0	8.6	8.5	45.3	45.2	44.9	44.2
9.	provide opportunities for students to develop **skills** needed to identify, investigate, and contribute to the resolution of environmental issues and problems.	n	3	2	6	--	44	5	425	78	421	114
		%	.3	1.0	.7		4.9	2.5	47.3	39.2	46.8	57.3
10.	provide students with opportunities to **gain actual experience** in resolving environmental issues.	n	3	1	20	3	146	22	411	91	318	82
		%	.3	.5	2.2	1.5	16.3	11.1	45.8	45.7	35.4	41.2
11.	Environmental education (EE) should be considered a priority in our K-12 educational system.	n	6	1	67	16	200	46	414	85	209	49
		%	.7	.5	7.5	8.1	22.3	23.4	46.2	43.1	23.3	24.9
12.	It is important that school districts be required to develop and implement an environmental education curriculum plan.	n	35	8	78	12	190	39	397	87	196	50
		%	3.9	4.1	8.7	6.1	21.2	19.9	44.3	44.4	21.9	25.5

For the next response, please use the following definition of infusion:

Infusion of education about the environment refers to the placing of environmental concepts and skills into an existing subject or course in a manner as to focus on those concepts and/or skills without jeopardizing the integrity of the original course. The aim is to "environmentalize" the existing course while still meeting the established objectives.

13	Education about the environment should be **infused** into the existing curricula in my school.	n	5	3	12	1	44	1	419	78	418	116
		%	.6	1.5	1.3	.5	4.9	.5	46.7	39.2	46.5	58.3
14	Education about the environment should be taught as a **separate subject** in my school.	n	261	62	348	79	153	22	86	28	47	6
		%	29.2	31.5	38.9	40.1	17.1	11.2	9.6	14.2	5.3	3.0

SECTION II

The purpose of this section was to obtain some general information about environmental education in the respondent's school and school district.

15. How many students are in your district?

		Principals (N=901)		Directors of Curriculum (N=199)	
		n	%	n	%
1.	under 1500	369	41.0	97	48.7
2.	1501-5,000	318	35.3	83	41.7
3.	over 5,000	214	23.8	19	9.5

16. Does your district have a written curriculum plan for environmental education?

	1. Yes		2. Not sure		3. No	
	n	%	n	%	n	%
P (N=891)	521	58.5	179	20.1	191	21.4
DC (N=197)	153	77.7	9	4.6	35	17.8

17. How satisfied are you that your school district's environmental education curriculum plan is being implemented effectively in your school/district?

	1. Very satisfied		2. Satisfied		3. Not sure		4. Dissatisfied		5. Very dissatisfied	
	n	%	n	%	n	%	n	%	n	%
P (N=521)	48	9.3	267	51.6	118	22.8	79	15.3	5	1.0
DC (N=151)	10	6.6	68	45.0	36	23.8	33	21.9	4	2.6

18. In your **best estimate**, how much financial support (excluding personnel costs) does your school and your school district provide specifically for environmental education? Circle the number **for each category** which corresponds with the amount of money budgeted in your school and the amount of money budgeted in your district.

<u>School</u> Budget for Environmental Education -	Principals - (N = 798)		<u>District</u> Budget for Environmental Education	Principals (N = 668)		Directors of Curriculum (N = 191)	
	n	%		n	%	n	%
1. Not funded	306	38.3	1. Not funded	224	33.5	36	18.8
2. $ 1 - $250	135	16.9	2. $ 1 - $250	45	6.7	11	5.8
3. $ 251 - $500	139	17.4	3. $ 251 - $500	72	10.8	28	14.7
4. $ 501 - $1000	102	12.8	4. $ 501 - $1000	93	13.9	41	21.5
5. $1001 - $1500	40	5.0	5. $1001 - $5000	124	18.6	54	28.3
6. $1501 - $2000	16	2.0	6. $5001 - $10,000	41	6.1	8	4.2
7. over $2000	60	7.5	7. over $10,000	69	10.3	13	6.8

19.- Does your school have a person designated as the environmental education specialist, coordinator or chairperson? -

	1. Yes		2. Not sure		3. No	
	n	%	n	%	n	%
P (N=898) -	369	41.1	75	8.4	454	50.6

20.- Please circle the response which most accurately describes the position: -

		Principals (N=364)	
		n	%
1.	full time, paid position	32	8.8
2.	part time, paid position	70	19.2
3.	voluntary position with release time	62	17.0
4.	voluntary position with no release time	200	54.9

19.‡ Does your district have one or more persons designated as the environmental education specialist(s), coordinator(s)

24.- or chairperson(s)?

	1. Yes		2. Not sure		3. No	
	n	%	n	%	n	%
P (N=896)	342	38.2	116	12.9	438	48.9
DC (N=198)	91	46.0	7	3.5	100	50.5

20.‡ Please check the box(es) which most accurately describes the district EE position(s): ‡

	first position (N = 91)		second position (N = 21)		third position (N = 13)	
	n	%	n	%	n	%
full time, paid position	7	7.7	3	14.3	2	15.4
part time, paid position	23	25.3	3	14.3	1	7.7
voluntary position with release time	19	20.9	2	9.5	-	-
voluntary position with no release time	42	46.2	13	61.9	10	76.9

21.- Does your school/district have an active environmental education committee?

22.‡

	1. Yes		2. Not sure		3. No	
	n	%	n	%	n	%
P (N=899)	208	23.1	80	8.9	611	68.0
DC (N=198)	66	33.3	10	5.1	122	61.6

22.- Does your school/district provide '**release time**' for the environmental education committee to meet?

24.

	1. Yes		2. Unsure		3. No	
	n	%	n	%	n	%
P (N=205)	81	39.5	13	6.3	111	54.1
DC (N=65)	45	69.2	1	1.5	19	29.2

23. Does your school provide **financial support** for the environmental education committee to meet?

	1. Yes		2. Unsure		3. No	
	n	%	**n**	%	**n**	%
P (N=206)	93	45.1	29	14.1	83	40.3
DC (N=65)	39	60.0	2	3.1	24	36.9

25. How many environmental education courses/in-services has your school or school district offered for teachers in the past three years?

	Principal (N=893)		**Director of Curriculum (N=198)**	
	n	%	**n**	%
1. 0	317	36.7	50	25.3
2. 1 - 2	336	38.9	81	40.9
3. 3 - 4	118	13.7	45	22.7
4. 5 - 6	39	4.5	11	5.6
5. 7 or more	53	6.1	11	5.6

26. Does your school and/or your school district provide financial support for teachers who wish to attend environmental education workshops or conferences not sponsored by your school or district?

	1. Yes		2. Unsure		3. No	
	n	%	**n**	%	**n**	%
P (N=898)	756	84.2	80	8.9	62	6.9
DC (N=199)	194	97.5	3	1.5	2	1.0

27. Does your school and/or school district provide **indirect funds** by way of payscale increments or other benefits to teachers who wish to attend environmental education workshops or conferences not sponsored by your school or district?

	1. Yes		2. Unsure		3. No	
	n	%	**n**	%	**n**	%
P (N=898)	427	47.6	107	11.9	364	40.5
DC (N=198)	99	50.0	8	4.0	91	46.0

28. In your best estimate, approximately how much time **per week** does the average teacher in your school spend teaching about the environment?

		Principal (N=891)		Director of Curriculum (N=199)	
		n	%	n	%
1. Less than 30 minutes		483	54.2	78	39.2
2. 31 minutes to 60 minutes	(1 hour)	254	28.5	68	34.2
3. 61 minutes to 90 minutes	(1 1/2 hours)	36	4.0	7	3.5
4. 91 minutes to 120 minutes	(2 hours)	13	1.5	2	1.0
5. 121 minutes to 150 minutes	(2 1/2 hours)	2	.2	1	.5
6. 151 minutes to 180 minutes	(3 hours)	-	-	1	.5
7. 181 minutes to 210 minutes	(3 1/2 hours)	-	-	-	-
8. 211 minutes to 240 minutes	(4 hours)	1	.1	-	-
9. Over 240 minutes	(more than 4 hours)	2	.2	-	-
10. Don't know		100	11.2	42	21.1

SECTION III

The purpose of this section is to obtain information about administrators' general support for EE. For the next nine statements, administrators indicated the extent to which they perform the following actions.

		to no extent		to a small extent		to a moderate extent		to a considerable extent		to a great extent		not applicable to my job	
		P	DC	P	DC	P	DC	P	DC	P	DC	P	DC
...distribute EE information. (PN=899; DCN=198)	n	3	3	61	22	197	45	284	59	343	59	11	10
	%	.3	1.5	6.8	11.1	21.9	22.7	31.6	29.8	38.2	29.8	1.2	5.1
...encourage the utilization of community resource people for EE. (PN=900; DCN=197)	n	24	5	103	24	245	54	301	63	217	44	10	7
	%	2.7	2.5	11.4	12.2	27.2	27.4	33.4	32.0	24.1	22.3	1.1	3.6
...arrange planning time for EE. (PN=896; DCN=198)	n	56	8	130	16	221	41	255	63	139	51	95	19
	%	6.3	4.0	14.5	8.1	24.7	20.7	28.5	31.8	15.5	25.8	10.6	9.6
...give encouragement for efforts to teach about the environment. (PN=900; DCN=199)	n	6	2	40	9	191	37	362	87	295	60	6	4
	%	.7	1.0	4.4	4.5	21.2	18.6	40.2	43.7	32.8	30.2	.7	2.0
...arrange/request staff training in EE. (PN=897; DCN=199)	n	117	26	224	33	233	57	172	50	80	17	71	16
	%	13.0	13.1	25.0	16.6	26.0	28.6	19.2	25.1	8.9	8.5	7.9	8.0
...support/authorize requests to attend non-district sponsored EE workshops. (PN=899; DCN=199)	n	14	3	48	6	138	25	347	69	322	88	30	8
	%	1.6	1.5	5.3	3.0	15.4	12.6	38.6	34.7	35.8	44.2	3.3	4.0
...write/assist with writing grants for EE. (PN=900; DCN=197)	n	398	44	141	32	94	37	58	32	38	33	171	19
	%	44.2	22.3	15.7	16.2	10.4	18.8	6.4	16.2	4.2	16.8	19.0	9.6
...emphasize/allow others to emphasize EE at staff meetings. (PN=898; DCN=198)	n	49	14	173	22	260	59	249	58	144	23	23	22
	%	5.5	7.1	19.3	11.1	29.0	29.8	27.7	29.3	16.0	11.6	2.6	11.1
..arrange for resources and materials needed for EE. (PN=898; DCN=198)	n	55	9	173	29	261	54	249	54	109	28	49	24
	%	6.1	4.5	19.3	14.6	29.1	27.3	27.8	27.3	12.2	14.1	5.5	12.1

PN = total number of principals responding; DCN = total number of directors of curriculum responding.

The purpose of this section was to identify potential barriers to including or increasing environmental education in administrators' school or school district. Three categories of barriers were identified: personal, school-related, and district-related barriers. For each category, respondents ranked up to three which were:

1=most applicable 2=second most applicable 3=third most applicable

38. Of the following barriers, which (if any) do you feel are MOST applicable to your **personal situation**.

			Ranked #1		Ranked #2		Ranked #3		% of N who gave item a rank*	
			P	DC	P	DC	P	DC	P	DC
a.	I do not have the knowledge or background to feel comfortable promoting EE.	n	94	13	161	25	92	24	347	62
		%	10.4	6.5	17.9	12.6	10.2	12.1	38.5	31.2
b.	I do not have the time to promote EE.	n	315	70	211	31	57	7	583	108
		%	35.0	35.2	23.4	15.6	6.3	3.5	64.7	54.3
c.	I do not have the personal interest.	n	11	5	25	6	67	6	103	17
		%	1.2	2.5	2.8	3.0	7.4	3.0	11.4	8.5
d.	I do not have any personal barriers.	n	395	86	73	21	69	11	537	118
		%	43.8	43.2	8.1	10.6	7.7	5.5	59.6	59.3
e.	Other	n	50	17	28	8	21	6	99	31
		%	5.5	8.5	3.1	4.0	2.3	3.0	10.9	15.6

*Percentage calculated by dividing the number of respondents who gave the item a rank by the total number of usable surveys (PN = 901; DCN = 199).

39. Of the following **school-related barriers**, which (if any) do you feel are MOST applicable to the situation in your school.

			Ranked #1		Ranked #2		Ranked #3		% of N who gave item a rank*	
			P	DC	P	DC	P	DC	P	DC
a.	Teachers in my school/district do not have the knowledge or back-ground to teach about the environment effectively.	n	49	11	58	14	58	13	165	38
		%	5.4	5.5	6.4	7.0	6.4	6.5	18.3	19.1
b.	There is not enough class time.	n	250	44	103	34	91	12	444	90
		%	27.7	22.1	11.4	17.1	10.1	6.0	49.3	45.2
c.	Teachers do not have enough planning time.	n	147	41	183	34	70	17	400	92
		%	16.3	20.6	20.3	17.1	7.8	8.5	44.4	46.2
d.	There is not enough funding.	n	102	17	93	15	91	12	286	44
		%	11.3	8.5	10.3	7.5	10.1	6.0	31.7	22.1
e.	There are not enough material resources for EE available in my school.	n	28	6	43	2	46	8	117	16
		%	3.1	3.0	4.8	1.0	5.1	4.0	13.0	8.0
f.	Teachers feel environmental concepts are unrelated to their subject area.	n	31	10	27	9	33	16	91	35
		%	3.4	5.0	3.0	4.5	3.7	8.0	10.1	17.6
g.	The school setting is not conducive to teaching about the environment.	n	5	-	6	1	5	-	16	1
		%	.6		.7	.5	.6		1.8	.5
h.	Teachers feel education about the environment is not appropriate for the grade level they teach.	n	1	-	1	1	3	1	5	2
		%	.1		.1	.5	.3	.5	.6	1.0
i.	Teachers do not have the interest in teaching about the environment.	n	18	3	29	3	21	7	68	13
		%	2.0	1.5	3.2	1.5	2.3	3.5	7.5	6.5

(Continued on next page)

(Continued from previous page)

			#1		#2		#3		% of N	
			P	DC	P	DC	P	DC	P	DC
j.	Teachers feel there are things other than EE that are more important to infuse into the classroom.	n	80	28	105	30	83	20	268	78
		%	8.9	14.1	11.7	15.1	9.2	10.1	29.7	39.2
k.	The staff development program does not currently provide opportunities for teachers to become more proficient in EE.	n	60	7	68	9	76	13	204	29
		%	6.7	3.5	7.5	4.5	8.4	6.5	22.6	14.6
l.	There are no school-related barriers in my school.	n	132	26	15	6	34	6	181	38
		%	14.7	13.1	1.7	3.0	3.8	3.0	20.1	19.1
m.	Other	n	21	8	8	1	8	3	37	12
		%	2.3	4.0	.9	.5	.9	1.5	4.1	6.0

*Percentage calculated by dividing the number of respondents who gave the item a rank by the total number of usable surveys.

40. Of the following **district-related** barriers, which (if any) do you feel are most applicable to the situation in your district?

			Ranked #1		Ranked #2		Ranked #3		gave item a rank*	
			P	DC	P	DC	P	DC	P	DC
a.	There are not enough funds available to support a quality EE program.	n	415	70	100	17	21	4	536	91
		%	46.1	35.2	11.1	8.5	2.3	2.0	59.5	45.7
b.	The school board is not supportive of EE.	n	15	3	29	4	36	1	80	8
		%	1.7	1.5	3.2	2.0	4.0	.5	8.9	4.0
c.	The District Administrator is not supportive of EE.	n	10	–	22	2	9	1	41	3
		%	1.1		2.4	1.0	1.0	.5	4.6	1.5
d.‡	The principals in my district do not support EE.	n	---	4	---	3	---	4	---	11
		%		2.0		1.5		2.0		5.5
d.~	The director of curriculum/instruction for my district is not supportive of EE.	n	8	---	17	---	15	---	40	---
		%	.9		1.9		1.7		4.4	
e.	There is not enough public support for EE in my district.	n	49	8	112	24	41	10	202	42
		%	5.4	4.0	12.4	12.1	4.6	5.0	22.4	21.1
f.	There are no district-related barriers in my district.	n	298	90	49	8	37	2	384	100
		%	33.1	45.2	5.4	4.0	4.1	1.0	42.6	50.3
g.	Other	n	59	18	22	6	10	6	91	30
		%	6.5	9.0	2.4	3.0	1.1	3.0	10.1	15.1

*Percentage calculated by dividing the number of respondents who gave the item a rank by the total number of usable surveys (PN = 901; DCN = 199).

41. Please indicate the top <u>three</u> statements which **BEST** represent the situation that would most influence you to include or increase environmental education in your school. Put a "1" in the box corresponding to the most influential situation, a "2" in the box corresponding to the second most influential situation, etc.

			Ranked						% of N who gave item a rank*	
			#1		#2		#3			
			P	DC	P	DC	P	DC	P	DC
a.	More support from my administration.	n	8	1	12	1	16	2	36	4
		%	.9	.5	1.3	.5	1.8	1.0	4.0	2.0
b.	More support from the Wisconsin Department of Public Instruction.	n	38	9	26	8	43	11	107	28
		%	4.2	4.5	2.9	4.0	4.8	5.5	11.9	14.1
c.	More in-service workshops on EE specifically for administrators.	n	32	2	33	8	36	10	101	20
		%	3.6	1.0	3.7	4.0	4.0	5.0	11.2	10.1
d.	More in-service workshops on EE for teachers.	n	98	33	131	27	125	23	354	83
		%	10.9	16.6	14.5	13.6	13.9	11.6	39.3	41.7
e.	Better access to resources for teaching about the environment.	n	64	12	92	18	101	23	257	53
		%	7.1	6.0	10.2	9.0	11.2	11.6	28.5	26.4
f.	More time.	n	324	79	179	33	84	12	587	124
		%	36.0	39.7	19.9	16.6	9.3	6.0	65.1	62.3
g.	More funding.	n	205	34	206	46	106	24	517	104
		%	22.8	17.1	22.9	23.1	11.8	12.1	57.4	52.3
h.	More public support for EE.	n	23	6	45	9	61	13	129	28
		%	2.6	3.0	5.0	4.5	6.8	6.5	14.3	14.1
i.	More teacher interest in EE.	n	91	17	96	25	78	28	265	70
		%	10.1	8.5	10.7	12.6	8.7	14.1	29.4	35.2
j.	Other	n	20	9	4	4	11	2	35	15
		%	2.2	4.5	.4	2.0	1.2	1.0	3.9	7.5

*Percentage calculated by dividing the number of respondents who gave the item a rank by the total number of usable surveys (PN = 901; DCN = 199).

Instrument Development Framework
Student Environmental Literacy Assessments

I. AFFECTIVE LEARNING OUTCOMES

- A. Environmental Sensitivity/Awareness
- B. Positive Attitudes and Values for the Prevention and Remediation of Environmental Problems and Issues Regarding:
  - 1. Air Quality
  - 2. Water Quality and Quantity
  - 3. Soil Quality and Quantity
  - 4.. Wildlife and Habitat
  - 5. Energy
  - 6. Human Population and Health
  - 7. Waste
  - 8. General Attitude Towards Environmental Problems

II. PERSPECTIVES ON ENVIRONMENTALLY RESPONSIBLE BEHAVIOR

- A. Locus of Control
- B. Assumption of Personal Responsibility

III. BEHAVIORAL LEARNING OUTCOMES

- A. Ecomanagement
- B. Economic Action
- C. Persuasion
- D. Political Action
- E. Legal Action
- F. Other

IV. COGNITIVE LEARNING OUTCOMES

- A. Knowledge of Ecological Principles
  - 1. Individuals, Populations, and Communities
    - a. Habitats, niches, and adaptations
    - b. Food chains, food webs
    - c. Population dynamics
    - d. Population and community interactions

2. Change and Limiting Factors
    a. Change as a natural process
    b. Biotic and abiotic limits to growth, size, and distribution of populations

3. Energy Flow
    a. Sun as primary source, other sources and forms of energy
    b. Transfer of energy through living systems
    c. First and second laws of energy (conservation of energy, entropy)
    d. Need for a consistent source of energy by systems and individuals
    e. Photosynthesis and respiration

4. Biogeochemical Cycling
    a. Conservation of matter; nutrient and materials cycling
    b. Hydrologic cycle

5. Ecosystems and Biodiversity
    a. Importance of biodiversity
    b. Interdependence of organisms
    c. Ecosystems

B. Knowledge of Environmental Problems and Issues

1. Air Quality
    a. Ozone Depletion
    b. Global Warming
    c. Acid Deposition
    d. Air Pollution

2. Water Quality and Quantity
    a. Water Pollution
    b. Use and Management

3. Soil Quality and Quantity
    a. Soil Depletion and Pollution
    b. Use and Management

4. Wildlife and Habitat
    a. Habitat and Biodiversity Loss
    b. Use and Management

5. Energy
    a. Sustainable and Non-renewable
    b. Consumption

6. Human Population and Health
    a. Overpopulation
    b. Environmental Health Hazards

7. Waste
    a. Solid Waste
    b. Hazardous Wastes

C. Knowledge of Environmental Issue Investigation and Action Strategies

1. Knowledge of strategies used to investigate environmental problems and issues
2. Knowledge of appropriate action strategies for the prevention or resolution of environmental problems and issues

Fifth Grade Environmental Literacy Assessment
Correspondence of Items to Instrument Development Framework

Instrument Development Framework	Item #s
I. AFFECTIVE OUTCOMES	
A. Environmental Sensitivity/Awareness	
B. Attitudes and Values for the Prevention and Remediation of Environmental Problems and Issues	5 - 19, 24
II. PERSPECTIVES ON ENVIRONMENTALLY RESPONSIBLE BEHAVIOR	
A. Locus of Control	20 - 22
B. Assumption of Personal Responsibility	23, 25, 26
III. BEHAVIORAL OUTCOMES	
A. Ecomanagement	27 - 29, 39, 40
B. Economic Action	30
C. Persuasion	31 - 38
D. Political Action	
E. Legal Action	
F. Other	
IV. COGNITIVE OUTCOMES	
A. Knowledge of Ecological Principles	
1. Individuals, Populations, and Communities	41 - 47
2. Change and Limiting Factors	48, 49
3. Energy Flow	50, 51, 53
4. Biogeochemical Cycling	52, 54, 55
5. Ecosystems and Biodiversity	56
B. Knowledge of Environmental Problems and Issues	
1. Air Quality	57 - 60
2. Water Quality and Quantity	62 - 65
3. Soil Quality and Quantity	61
4. Wildlife and Habitat	66 - 68
5. Energy	69 - 74
6. Human Population and Health	75, 76
7. Waste	78
C. Knowledge of Environmental Issue Investigation and Action Strategies	77,79

High School Environmental Literacy Assessment
Correspondence of Items to Instrument Development Framework

Instrument Development Framework	Item #s
I. AFFECTIVE OUTCOMES	
A. Environmental Sensitivity/Awareness	6 - 9
B. Attitudes and Values for the Prevention and Remediation of Environmental Problems and Issues	10 - 28
II. PERSPECTIVES ON ENVIRONMENTALLY RESPONSIBLE BEHAVIOR	
A. Locus of Control	30-34
B. Assumption of Personal Responsibility	29, 35
III. BEHAVIORAL OUTCOMES	
A. Ecomanagement	36, 39, 43, 44
B. Economic Action	37, 40, 45, 49
C. Persuasion	38, 41, 46, 50
D. Political Action	42, 47
E. Legal Action	51
F. Other	48
IV. COGNITIVE OUTCOMES	
A. Knowledge of Ecological Principles	
1. Individuals, Populations, and Communities	52 - 55, 57, 63, 64
2. Change and Limiting Factors	59, 68
3. Energy Flow	58, 60, 65, 67
4. Biogeochemical Cycling	56, 66
5. Ecosystems and Biodiversity	61, 62, 69
B. Knowledge of Environmental Problems and Issues	
1. Air Quality	70, 71, 76, 79
2. Water Quality and Quantity	74, 78, 80
3. Soil Quality and Quantity	73, 81
4. Wildlife and Habitat	75
5. Energy	82, 85, 84
6. Human Population and Health	72, 83
7. Waste	77
C. Knowledge of Environmental Issue Investigation and Action Strategies	86-90

Description of Item Analysis and Criteria Used for Selection of Items included in the Student Environmental Literacy Assessment Instruments

Item Analysis

A portion of the statistical analysis was performed by Testing and Evaluation Services at the University of Wisconsin-Madison. The resulting report included the following information for each of the pilot assessments:

1. Frequencies of responses for each answer choice for each item.
2. Summary statistics for the three subscales (affective, behavioral, and cognitive) including number of examinees, number of items, mean score, standard deviation, and reliability. Summary statistics for the cognitive subscales also included mean item difficulty, standard error of measurement, maximum and minimum attainable score, and maximum and minimum attained score.
3. A roster of students listing individual scores on the cognitive section.
4. Frequency distribution by total score for the cognitive section.
5. Item difficulty summary for the cognitive section.
6. Item discrimination summary for the cognitive section.
7. Item analysis for each cognitive item (described below).

The item analysis of the cognitive items was done using the individual students' total scores on the cognitive section of each test as the criterion for effectiveness of an individual item. Each student population was divided into five groups based on an even numerical division of the population and the total scores on that section of the test (quintile groups). Therefore, the 20% of the students scoring highest on the cognitive section of the test were in one quintile group, the next highest scoring 20% in another quintile group, etc. The division into quintile groups was done in order to have a manageable number of groups for use in examining the performance of each item on the cognitive portion of each test. The item analysis included individual item correct response curves (by quintile), item difficulties, and point biserial correlation (RPBI). The point biserial correlation statistic for the choices for each cognitive item provided the item discrimination index. This index indicated whether or not there was a tendency for students who selected that choice to have relatively high overall scores in the cognitive section (indicated by a positive RPBI) or for students who choose it to have relatively low overall scores in the cognitive section (indicated by a negative RPBI).

Additional statistical analysis of the reliability of the affective, efficacy beliefs, behavioral, and cognitive subscales of each instrument was carried out by the researcher using the SPSS computer program. The SPSS reliability analysis provided the following statistics:

1. Subscale mean if item deleted
2. Subscale variance if item deleted
3. Corrected item total correlation within subscale
4. Alpha for subscale if item deleted
5. Reliability coefficient (alpha) for subscale
6. Number of items
7. Number of examinees

As described below, portions of both sets of statistics were used in determining which items to include in the final instrument.

Assembly of Final Instruments: Criteria for Inclusion of Items

After statistical data were obtained on the items and the subscales contained in the pilot instruments, the next procedure was to determine which items should be included in the final instrument. Items were evaluated based on the statistical criteria outlined below. In some cases, the items did not meet all the statistical criteria but were retained because they met the general criteria. That judgment was made by the researchers if the item was considered to contain a concept believed to be necessary to include in an assessment of environmental literacy based on the comments made by the validity panel. In those cases, the items were rewritten to address possible weaknesses in wording or distractors.

General criteria:

1 Items selected should be considered to have importance to environmental literacy as determined by the validity panel and the working group.

2. All major components of the content framework outline should be represented by items in the final pilot instrument.

Statistical criteria:

3. A particular item was excluded in the final pilot if its exclusion from the subscale in which the item was analyzed would have resulted in a higher reliability score (coefficient alpha) for the subscale.
4. Cognitive items should appear to discriminate between students as indicated by the point biserial correlation index (RPBI score). For items that discriminated, a higher percentage of students scoring in the top quintile groups selected the preferred answer (indicated by a positive RPBI score) while higher percentages of students in the bottom quintile groups selected each distracter (indicated by negative RPBI scores).
5. Cognitive items should generally fall into a mid-range of statistical difficulty (50-80% of the students selected the preferred answer).
6. Affective and behavioral items should demonstrate a range of responses as indicated by a standard deviation greater than one (>1)
7. The corrected item total correlation should be greater than 0.25, indicating that the individual item correlated relatively highly with the other items on that subscale.

Demographic Survey Given to Teachers Administering the Student Environmental Literacy Assessments

To the Administering Teacher:

Please answer the following questions regarding the students taking the Environmental Survey. This information is important in the analysis of the surveys and will be used to compile a final report to various state agencies. Please return this form with the student answer sheets in the prepaid envelope provided. Thank you for your cooperation!

1. What size community do **most** of the students live in? (please circle only one)

   a) rural or small town (population of community is less than 20,000)
   b) small to medium urban (population of community is 20,000 to 100,000)
   c) large urban (population of community is more than 100,000)

2. Do you think the students in this class are representative of the students at this grade level in your district?

   a) yes
   b) no
   c) not certain

3. We are trying to determine if students who are identified by their teachers as being 'environmentally literate' do better on this assessment than those who are not so identified. Therefore, we are asking you to please list up to five or six students in this class by first name and last initial who you would say are particularly knowledgeable and concerned about the environment and environmental issues. These students need not necessarily be the students who are the highest achievers in their normal work. Responses will be anonymous — the identified students will be scored as a group and not as individuals.

   1) _____
   2) _____
   3) _____
   4) _____
   5) _____
   6) _____

Secondary teachers only:

4. Indicate the subject area of this class (please circle only one):

a)	agriculture	g)	math
b)	art	h)	music
c)	business	i)	science
d)	health	j)	social studies
e)	home economics	k)	technical education
f)	English language arts	l)	other_____

Results of Teacher Survey t-test

Comparisons Between Teachers Who Have and Have Not Received In-service EE Training Relative to Their Perceived EE Competencies, Attitudes, and Class Time Spent

	N	n	M	SD	t	DF	Probability
Competencies							
Overall	527				3.32	525	.001
In-service		215	3.69	.58			
No In-service		312	3.52	.60			
Cognitive	591				3.67	589	.000
In-service		235	3.85	.66			
No In-service		356	3.65	.64			
Affective	582				3.35	580	.001
In-service		228	3.74	.69			
No In-service		354	3.54	.68			
Actions	576				2.17	574	.030
In-service		227	3.26	.80			
No In-service		349	3.12	.81			
Attitudes	604				3.04	602	.002
In-service		236	4.23	.60			
No In-service		368	4.09	.51			
Class Time							
Item 13	615				4.15	613	.000
In-service		238	2.18	1.06			
No In-service		377	1.85	.91			
Item 14	604				3.37	602	.001
In-service		235	1.53	1.13			
No In-service		374	1.29	.62			
Item 153	607				3.43	605	.001
In-service		233	2.35	1.59			
No In-service		374	1.94	1.34			

Results of Teacher Survey t-test

Comparisons Between Teachers Whose Districts Have and Do Not Have EE Curriculum Plans Relative to Their Perceived EE Competencies, Attitudes, and Class Time Spent

	N	n	M	SD	t	DF	Probability
Competencies	437				3.54	435	.000
Plan		170	3.77	.55			
No Plan		267	3.58	.53			
Attitudes	507				.03	505	.978
Plan		202	4.18	.63			
No Plan		305	4.17	.50			
Class Time							
Item 13	514				4.16	512	.000
Plan		202	2.31	1.06			
No Plan		312	1.94	.93			
Item 14	509				1.05	507	.296
Plan		201	1.46	.88			
No Plan		308	1.37	.89			
Item 153	507				2.85	505	.005
Plan		200	2.36	1.46			
No Plan		307	2.00	1.31			

Chi-square comparisons between principals who have not attended any environmental education courses, in-services or workshops and those who have attended 3 or more EE courses relative to the degree of action they take to support EE in their school.

(Items 29-37)		None	3 or more courses	c^2	d.f.	p =
I distribute EE information to a teacher (or teachers) in my school. (N = 527)	(n)	(202)	(325)	24.61478	4	.00006
	μ	3.85	4.16			
I encourage the utilization of community resource people to benefit EE programs or projects in my school. (N = 527)	(n)	(200)	(327)	27.19692	4	.00002
	μ	3.44	3.91			
I arrange equitable planning time...for teachers developing EE programs. (N = 468)	(n)	(175)	(293)	34.29624	4	.00000
	μ	3.07	3.56			
I give encouragement to a teacher(s)...for their efforts to teach about the environment. (N = 526)	(n)	(201)	(325)	38.06121	4	.00000
	μ	3.78	4.25			
I arrange or make requests for staff training and/or in-services in EE. (N = 485)	(n)	(183)	(302)	62.51864	4	.00000
	μ	2.36	3.20			
I support/authorize teacher requests to attend EE workshops, ...outside of district sponsored in-services. (N = 512)	(n)	(193)	(319)	19.69104	4	.00057
	μ	3.86	4.19			
I write or assist with writing grants to fund or support EE projects or programs. (N = 423)	(n)	(157)	(266)	48.34458	4	.00000
	μ	1.55	2.29			
I make an effort to emphasize or allow others to emphasize EE projects and/or programs at staff meetings. (N = 512)	(n)	(190)	(322)	45.30845	4	.00000
	μ	3.00	3.61			
I arrange or make requests for resources and materials needed for EE programs and projects. (N = 496)	(n)	(187)	(309)	61.58726	4	.00000
	μ	2.81	3.58			

(n) = number of individuals indicating item was one of top three school-related barriers.
μ = mean response of subpopulation.